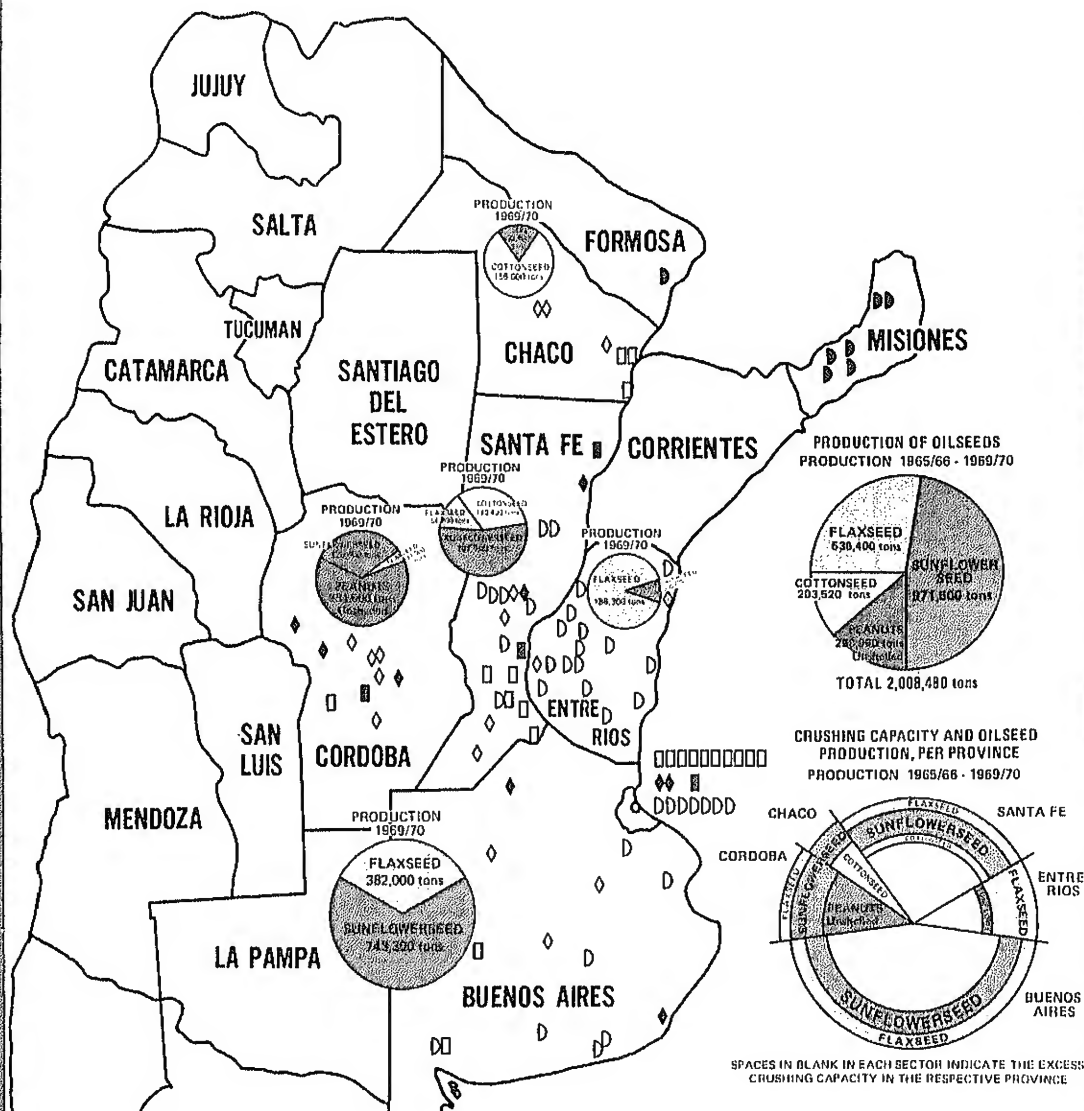


**PRODUCTION  
AND TRADE  
PROSPECTS  
FOR  
ARGENTINE  
OILSEEDS  
AND THEIR  
PRODUCTS**

# THE VEGETABLE OIL INDUSTRY AND OILSEED PRODUCTION IN ARGENTINA



- ◊ "EXPELLERS"
- ◆ "EXPELLERS" WITH REFINING PLANT
- ◊ "EXTRACTION"
- ◻ "EXTRACTION" WITH REFINING PLANT

- "EXTRACTION - EXPELLER"
- D "EXPELLER" FLAXSEED
- D TUNG OIL PLANT

## PRINCIPAL GRAIN SHIPPING PORTS

- |                          |                     |
|--------------------------|---------------------|
| I - SANTA FE             | VII - DIAMANTE      |
| II - SAN LORENZO         | VIII - BUENOS AIRES |
| III - ROSARIO            | IX - LA PLATA       |
| IV - VILLA CONSTITUCION  | X - MAR DEL PLATA   |
| V - SAN NICOLAS          | XI - NECOCHEA       |
| VI - SAN PEDRO           | XII - BAHIA BLANCA  |
| XIII - DEMA - SAN MARTIN |                     |

SOURCE: J. J. HINRICHSSEN  
BUENOS AIRES

## FOREWORD

The purpose of this study is to review the factors affecting the production and marketing of oilseeds and products in Argentina in order to measure the future competition or market for U.S. exports of these commodities. This study is one of a series expected to be published on this subject.

Much of the material presented in this report was gathered during visits to Argentina in 1970 and 1971 by representatives of the Foreign Competition Branch. Assistance was given to the authors by officials of the Argentine Government, particularly by representatives of the National Grain Board and the National Institute of Agricultural Technology. Valuable help also was given by leaders of Argentine producers' organizations and representatives of the private oilseed trade. Particular thanks go to Mr. J. J. Hinrichsen not only for his advice on the oilseed situation in Argentina, but for the use of his illustrations of oilseed-producing areas and processing facilities.

The authors are especially indebted to Joseph C. Dodson, U.S. Agricultural Attache to Argentina, at the time of the visit; his assistant attaches then, Gordon Lloyd and James Rudbeck; and his staff, who made travel and appointment arrangements, furnished data and other information, and provided valuable advice and guidance.

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# Production and Trade Prospects for Argentine Oilseeds and Products

John K. Lynam  
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## INTRODUCTION

Argentina, with one of the richest agricultural land areas in the world, is a stiff U.S. competitor in world oil and meal markets. Argentina sunflower oil is a major competitor with U.S. soybeans and/or oil in West European markets, as well as with U.S. vegetable oil in Latin America. Exports of peanut and cottonseed oils compete with U.S. products in Western Europe, as do cake and meal shipments with U.S. soy protein. In addition, Argentine shipments of linseed meal and oil—the world's largest—compete directly with U.S. exports, especially in the European Community (EC), where 75 percent of the Argentine exports are sold.

Argentina is also the world's leading exporter of tung oil—a commodity traditionally imported by the United States.

These oil and meal shipments are particularly important to Argentina, since it derives almost 90 percent of its foreign exchange earnings from agricultural exports and counts oilseed production as its third most important agricultural pursuit next to

livestock and grain output. Moreover, Argentina derives added revenue from these and other exports by maintaining domestic farm prices below world levels and appropriating the difference as an export tax—a tax that ranks as the Government's major source of revenue.

Besides this dependence on the world market, Argentine oilseed production is influenced by pressures of expanding domestic demand and by competition for acreage from grains and livestock. The livestock industry, although the world's largest, has had difficulty maintaining adequate supplies of meat for both domestic consumption and exports, and its expansion efforts could be translated into increased use of oilcake and meal for domestic livestock feeding. Also, any expansion in pasture or grain area could cut into oilseed production.

It thus appears that further advances in traditional Argentine oil and meal exports will depend on Argentina's ability to increase yields per acre.

## PHYSICAL CHARACTERISTICS AND CROP DISTRIBUTION

The 279.2 million hectares (1 hectare = 2,471 acres) that comprise Argentina are characterized by diversity in both climate and topography. In terms of precipitation, 24 percent of the land mass is classified as humid, 15 percent semiarid, and 61 percent arid. Climatic and topographical variations provide for the natural division of Argentina into six distinct agricultural regions, only one of which, the Pampa, is conducive to the widespread cultivation of annual grain and oilseed crops, though marginal cultivation of grains and oilseeds exists in the four regions north and west of the Pampa. Rainfall and growing season on the Pampa vary considerably, decreasing from north to south and east to west.

The Pampa comprises a semicircle that stretches 350 miles around the Federal City of Buenos Aires. It includes Buenos Aires Province, as well as parts of Cordoba, Santa Fe, Entre Rios, and La Pampa Provinces.

At the time of the Argentine colonization, the Pampa was flat or gently undulating virgin grasslands, similar to the American Great Plains and characterized by deep, black, chernozem soil. It now serves as the center of Argentine agriculture, accounting for over 90 percent of grain and oilseed production and around 80 percent of cattle production.

The Pampa is climatically divided into humid and semiarid regions. The humid region comprised basically the eastern two-thirds of the Pampa. Average annual rainfall in this region varies from 25 to 40 inches, and the growing season ranges from 240 to 335 days. The western semiarid region has an average annual rainfall of from 18 to 31 inches, with year-to-year fluctuations being quite large, as verified by the fact that half of the years on record have been drought years. The growing season varies from 190 to 245 days, making agriculture suitable for only small grains and livestock.

The more humid Northwest section of Argentina specializes in the production of sugarcane, tobacco, and citrus fruits. The Chaco region, just east of the Northwest region, is the major source of cotton in the country, with production centered around Presidencia Roque Saenz Pena. The Northeast region, consisting of Corrientes and Misiones Provinces, specializes in citrus fruits, tobacco, rice, and cotton. Tung nuts and soybeans are produced primarily in Misiones Province.

The Pampa, however, remains the breadbasket of Argentine agriculture and accounts for most of the agricultural exports of livestock, grain, and oilseed products. Variations in soil, temperature, and growing season on the Pampa have caused various oilseed and grain crops to be localized in specific production belts for sheep and cattle breeding.

The southern part of the Pampa from Bahia Blanca to Mar del Plata is devoted to wheat, flaxseed, and other small grains. The east-central region is characterized by very flat land with poor drainage, which limits natural pasture growth and prevents the cultivation of most crops, though it is suitable for sheep and unfinished cattle production. The midwestern region produces primarily cattle and supporting forage crops, largely alfalfa and small grains plus corn and grain sorghum. The north-central region is the primary producing area for corn, sunflowerseed, grain sorghum, and feeds for hogs and cattle; the northeast—flaxseed and wheat. The area directly surrounding the capital (Buenos Aires) specializes in dairying and truck farming, supplying the capital city with fresh dairy and vegetable products. The semiarid Pampa to the west is limited to production of cattle and small grains. Peanut production is concentrated at the northwestern fringes of the Pampa in the Province of Cordoba.

## A LOOK AT ARGENTINE AGRICULTURE

The agricultural sector in Argentina, while contributing only 15 percent to the gross domestic product and employing 15 to 20 percent of the labor force, nevertheless accounts for over 85 percent of the total value of exports. Argentina produces a wide variety of agricultural products, lending diversity to exports while providing for domestic consumption needs. Grains, oilseeds, and livestock are consistently the largest production categories, although other crops, primarily outside the Pampa, are increasing. Agriculture thus continues to be an integral part of the Argentine economy, in spite of the expanding industrial and service sectors.

### Major Cropping Patterns

Argentine agriculture is primarily oriented to grain and livestock production, which is concentrated in the Pampa. Land crop planted to grains generally accounts for approximately 50 percent of total acreage planted to annual and tree crops. Wheat acreage has accounted for a majority of the total, with major concentrations in the southwest and north-central areas. Corn and grain sorghum are also major grain crops, with corn concentrated in the northern half of the Pampa and sorghum grown in the west-northwest. Barley, oats, and rye constitute the dual-purpose grains in that they are grown both for grain harvest and as winter forage for cattle. They are grown primarily in the large cattle production areas in the western half of the Pampa, along with forage crops, primarily alfalfa. The only other major crops, beside grains and forages, grown in the Pampa, are oilseeds, principally sunflowerseed, flax, and peanuts. Sunflowerseed production is spread over most of the central portion, flax is concentrated in the south and northeast, and peanuts are cultivated primarily in Cordoba Province in the Northwest.

Fruits, industrial crops other than flaxseed, and garden crops, are produced primarily outside the Pampa. Unlike the production in the Pampa, though, these crops are used almost exclusively for domestic consumption. The Pampa region produces almost all of Argentina's exportable surplus, primarily grains, livestock products, and vegetable oilseeds, making production there somewhat responsive to foreign demand. Variations in foreign demand have been largely

responsible for variations in agricultural production of the major export items.

Agriculture in the Pampa and that outside the Pampa has shown two distinct trends.

Agricultural production outside the Pampa has risen consistently since the turn of the century. This is due to rising domestic demand, caused by increases in both population and per capita income, for agricultural crops such as tobacco, sugar, cotton, fruits, and vegetables. Since there is more marginal land in these areas, there is greater flexibility in changing crop acreage. Increases in production have been a result of expansion in cultivated acreage, which has doubled since 1935-39. Also, there has been more diversification of cropping patterns and less competition from livestock production, than in the Pampa.

Agricultural production trends in the Pampa, on the other hand, reflect increased competition for land among crop and livestock enterprises, and the influence of the export sector on demand and prices for agricultural products. Total acreage planted to crops in the Pampa increased dramatically from the turn of the century until the late thirties, and then plateaued out, at which point demand for land devoted to pastures and forage crops that supported livestock operations began exerting pressure on the demand for land devoted to crops.

The resulting competition for land between the two enterprises was a product of the extensive agriculture practiced in Argentina. Because of the large land area under natural pastures, the relatively low cost of land, and the sufficient labor supply, increases in demand for crops were met by increases in acreage. Yields did not show any significant rising trend, as there was little intensification of cultivation practices and only minor application of fertilizers.

Simultaneously with the reaching of the balance between acreage planted to crops and that left in pastures for livestock usage, new economic factors began to influence production trends. Up to the 1930's, the Argentine Government had maintained an open-market policy, and Argentine agriculture had reacted favorably to a strong world demand for grains and flax by steadily increasing acreage and production. Then, with the world economic depression in the thirties and the decrease in export demand for agricultural products, the Government was forced to

TABLE 1--ACREAGE PLANTED TO CROPS IN BUENOS AIRES PROVINCE

[ In thousands of hectares ]

Year	Wheat	Corn	Grain sorghum	Small grains (1)	Total grain	Linseed	Sunflower	Total oilseeds (2)
1954-55 ....	2,791.5	1,181.7	22.3	1,558.0	5,553.5	225.0	304.8	529.8
1955-56 ....	2,402.7	1,079.0	26.4	1,654.9	5,163.0	195.5	749.1	944.6
1956-57 ....	2,860.7	956.7	32.2	1,925.2	5,783.8	238.4	732.3	971.7
1957-58 ....	2,625.7	999.1	103.0	1,757.3	5,485.1	291.6	1,074.9	1,366.5
1958-59 ....	2,975.6	966.4	143.0	1,831.9	5,916.9	315.6	888.9	1,204.5
1959-60 ....	2,370.3	960.0	197.0	1,961.0	5,488.3	362.8	823.0	1,185.8
1960-61 ....	2,214.5	935.0	265.0	1,633.0	5,047.5	319.5	684.7	1,004.2
1961-62 ....	2,430.5	940.0	330.2	1,315.3	5,016.0	351.4	749.0	1,100.4
1962-63 ....	2,185.5	872.0	307.0	1,037.6	4,402.1	348.4	577.0	925.4
1963-64 ....	3,350.4	890.0	288.2	1,419.6	5,918.2	344.5	528.0	872.5
1964-65 ....	3,407.2	850.8	262.6	1,241.6	5,762.2	333.3	591.9	925.2
1965-66 ....	2,916.2	928.3	246.9	976.8	5,068.2	372.0	626.9	998.9
1966-67 ....	3,421.3	1,059.2	259.0	956.6	5,696.1	320.3	704.3	1,024.6
1967-68 ....	3,796.3	1,076.7	328.3	1,079.2	6,280.5	318.2	634.8	953.0
1968-69 ....	3,621.7	1,173.7	386.3	1,013.7	6,195.4	392.6	788.1	1,180.7
1969-70 ....	3,449.0	1,340.0	415.9	910.3	6,115.2	464.2	865.6	1,329.8
1970-71 ....	2,635.7	1,542.1	591.6	(4)	(4)	524.2	899.6	

Year	Alfalfa	Small grains (3)	Sudan grass	Sugared sorghum	Grain sorghum	Total forages	Total grains & oilseeds	Total
1954-55 ....	2,612.5	1,094.9	181.4	6.6	240.0	4,135.4	6,083.3	10,218.7
1955-56 ....	2,505.0	1,196.8	202.7	14.2	240.0	4,158.7	6,107.6	10,266.3
1956-57 ....	2,654.0	1,184.5	193.1	20.3	240.0	4,291.9	6,755.5	11,047.4
1957-58 ....	2,781.0	1,270.8	205.6	13.9	229.0	4,500.3	6,851.6	11,351.9
1958-59 ....	2,826.0	1,245.9	286.0	18.0	96.0	4,471.9	7,121.4	11,593.3
1959-60 ....	2,908.0	1,192.0	333.0	31.8	50.0	4,514.8	6,674.1	11,188.9
1960-61 ....	2,859.3	1,289.8	326.3	64.7	22.2	4,562.3	6,051.7	10,614.0
1961-62 ....	2,928.0	1,144.1	347.9	75.1	15.2	4,510.3	6,116.4	10,626.7
1962-63 ....	2,408.1	1,254.5	275.7	113.3	4.7	4,056.3	5,327.5	9,383.8
1963-64 ....	2,378.8	1,053.2	291.8	122.6	5.4	3,851.8	6,820.7	10,670.5
1964-65 ....	2,259.8	787.4	287.3	127.0	5.0	3,466.5	6,687.4	10,153.9
1965-66 ....	2,057.7	755.8	291.3	146.3	4.4	3,255.5	6,067.1	9,322.6
1966-67 ....	1,934.3	1,048.9	287.0	170.9	4.5	3,456.6	6,720.7	10,166.3
1967-68 ....	1,727.4	933.8	264.1	243.9	5.6	3,174.8	7,233.5	10,408.3
1968-69 ....	1,707.3	1,179.8	288.6	270.6	6.3	3,452.6	7,376.1	10,828.7
1969-70 ....	1,831.8	1,120.4	303.4	317.6	3.1	3,576.6	7,445.0	11,021.5
1970-71 ....	1,654.2	(4)	265.9	341.7	(4)	(4)	(4)	(4)

<sup>1</sup> Includes barley, oats and rye for grain; small grain acreage not available for breakdown into usage for grain and forage in 1971.

<sup>2</sup> Includes linseed and sunflowerseed only.

<sup>3</sup> For forage only.

<sup>4</sup> Not available.

set up marketing controls to manage the surplus that developed. Minimum producer prices were instituted, and grain was exported by government marketing agencies. This caused a relative stagnation in crop production compared with previous growth. World War II caused further impediment to trade because of shipping blockages.

Agricultural production should have responded to the post-war grain deficits in world markets. However, the Peron Administration, elected in 1946, immediately instituted a policy of industrializing the nation. This policy was subsidized by the transfer of capital and labor out of the agricultural sector, through marketing and price controls.

The Argentine Trade Promotion Institute (Instituto Argentino Para la Promocion del Intercambio — IAPI) was set up to purchase all domestically produced grains. The IAPI bought the grain at support prices much lower than the high prices existing in the world market at that time and, by exporting at world market prices, built up large foreign exchange reserves. However, because of the lack of price incentive to producers, grain acreage decreased substantially, depressing Argentine agriculture and contributing to heavy migration from rural to urban areas. This stagnation continued until the reestablishment of a free market structure in the late 1950's.

Low crop prices resulted in a more rapid shift to increased livestock production. Livestock numbers, principally cattle, increased on a steady upward trend until the mid-fifties, as this was the enterprise among production possibilities that appeared to offer the greatest profit and/or lower capital investment. According to Census data, the number of cattle rose 24 percent from 1937 to 1947 to a level of over 41 million head. By 1955, the number of cattle had risen to 43.8 million head. Land was diverted out of grain crops and seeded to pasture, alfalfa, and other forages.

During the early fifties, crop production on the Pampa started to recover and by the late sixties, it had reached the level attained in the thirties. Grain production increased dramatically in this period, particularly between 1965 and 1970 primarily as a result of increased corn and grain sorghum plantings. Oilseed production increased from 1.4 million tons in the 1950-55 period to 2.0 million in 1965-70. However, because of encroaching urbanization and increased in per capita income, exportable supplies have not reached the previous high levels.

Several factors contributed to the instability of agricultural production in general during this period and continued to exert an influence into 1972. Rampant inflation and high interest rates have limited capital investment to the extent that capital needs to be borrowed. General inflationary and related economic instability, combined with uncertain policies,

have created risks that divert capital away from agriculture to industries with higher returns.

Another factor involved in reduced exports has been the change in the crop mix. Also, there has been a shift to greater use of barley, oats, and rye as forage.

### The State of Argentine Farm Technology

Using yields as a general index of the state of agricultural technology, it appears that since the late thirties there has been little increase in technology applied to crop production. Yields have either stagnated or, in some cases, decreased. This was particularly true between 1946 and 1956, when agriculture was depressed and few agricultural inputs were used in production. Costs were reduced as much as possible, in light of low producer prices.

In many countries, increases in productivity have generally been associated with increases in fertilizer usage per hectare of cultivable land, both on an absolute basis and relative to most other nations in the world. Even among nations with very extensive agriculture, Argentina still has a negligible rate of fertilizer application. Most fertilizer, primarily nitrogen, is applied to intensively grown crops (those that yield a relatively high return per acre) produced primarily outside the Pampa region, principally sugarcane, tobacco, and fruits.

Many Argentines have claimed that the reason for the lack of fertilizer usage on cereal and oilseed crops is that the Pampa is such a naturally fertile plain that little additional fertilizer is needed. However, experimental test plots seem to indicate quite a strong response, especially for wheat, from the application of fertilizer. The major reason for farmers' reluctance to apply fertilizer to grain crops appears to be its excessively high cost in relation to increases in production. Up until the early sixties, most fertilizer was imported, as there were negligible amounts produced domestically. Fertilizer was subject to a 20-percent import duty and an additional 50-percent increase above import price for transportation, storage, and retailer and wholesaler margins. Cost return ratios thus thwarted the widespread application of fertilizer to the extensively cultivated cereal and oilseed crops.

The extensive agriculture practiced in Argentina and the high percentage of cultivable land contained in large farms made the mechanization of cereal and oilseed production and harvest quite economical and easily implemented. However, factor-product price relationships were the major deterrents to full-scale mechanization of Argentine agriculture, especially during its depressed period from the late thirties to the mid-fifties.

Since that time, mechanization of all phases of production, from planting to harvest has proceeded at a fairly accelerated rate. However, machinery prices

still have remained high compared with prices in almost all other agricultural nations. This is due to the Government's policy of fostering the development of a domestic farm machinery industry by the imposition of a high duty on all imports. These domestic firms are foreign subsidiaries, have relatively limited market, and must import a high percentage of parts, all contributing to higher prices.

Nevertheless, mechanization in the last decade has proceeded at a high rate because of (1) continued high migration of labor out of the rural sector into the urban areas; (2) the good investment that machinery is, in the light of rapid inflation; and (3) the greater competition for cultivable land used for grazing.

Pesticide usage relative to most developing countries is quite high in Argentina, but it is still far below that of the United States. Pesticides have been mainly used in the production of intensively cultivated crops, but with the advent of crop dusting via airplanes, more widespread use on extensively cultivated crops has been evident. Herbicides also are showing increased usage on corn and oilseed crops. Most of the chemical pesticides and herbicides are produced domestically, with a protective duty applied to imports. Increases pesticide and herbicide usage on major grain and oilseed crops seems probable in the future, in view of increases in the returns to such usage.

### Land Distribution and Tenure

The extensive agriculture practiced in Argentina is reflective of the size of farmholdings and the land tenure system. The area devoted to farms in 1969 was 205 million hectares, up 17 percent from the 1960 figure of 175 million. This 1969 area was distributed among 549,000 farms, up 16 percent from 472,000 farms in 1960. The increases left the average size of the farm relatively unchanged at just over 370 hectares per farm unit. This figure, however, is not totally reflective of the large-scale agriculture practiced in Argentina.

According to the 1960 census, 78 percent of all the farms in Argentina were less than 200 hectares, yet they controlled only 10 percent of the land area in farms. Only 5 percent of the farms were over a 1,000 hectares, yet these controlled 74 percent of the land in farms. These facts in part reflect the large grazing operations in the drier parts of the country, particularly the Patagonia area.

On the Pampa, where almost all of the grain and oilseed crops are grown, the land distribution also points to the dominance of large operations. Three-quarters of the farms on the Pampa were 200 hectares or less, while they contained less than one-fifth of the land in farms. The very large farms of over 1,000 hectares numbered only 4.4 percent of total farms on the Pampa, but controlled over half of the land area

in farms. These figures are indicative of the large cattle-oriented operations that dominate the Pampa region, particularly since 66 percent of the land area in the Pampa is under seeded or natural pastures.

Proprietorships were the principal form of land tenure in Argentina, at the time of the 1960 census. Proprietors managed 49.5 percent of the farms, which amounted to 53 percent of total farmland. This form of tenure has shown an increasing trend since the forties. Renters managed 16.5 percent of the farms, amounting to 10.6 percent of total area in farms, which has shown a decline since the forties. On the Pampa, the number of proprietors amounted to 42 percent of all proprietors in the country. Rental and sharecropping arrangements were significant only in the Pampa, where 26 percent of the farms were under this type of management, accounting for 65 percent of all renters and sharecroppers.

This land — tenure system highlights the division of interests between cattle and crop (mainly grain and oilseed) operations on the Pampa. The very large farms are primarily devoted to large, extensive cattle operations, while the smaller ones generally specialize in crop production. The large landowners, however, exercise some flexibility in land usage, as price relationships between cattle and crops (grains, primarily) change. If grains are more remunerative, these landowners will cut back on cattle operations. As landownership practices have changed in recent years, the large landowners are now operating much of the land formerly used by tenants.

### Agriculture's Contribution to the GNP

Agriculture is a vital element in the nation's economy, though it only makes up around 15 percent of the gross domestic product. Agriculture's major contribution to the nation's economy lies in its diversity. It provides almost all the domestic food needs of the population, plus producing a substantial surplus which is utilized by the major commercial markets of the world. Agricultural products, accounting for approximately 90 percent of total exports, are the primary source of foreign exchange earnings. In addition, Argentina's cultural wealth has provided the financing for a massive import substitution program designed to industrialize the economy, which has resulted in a decline in farm production.

Marketing of agricultural commodities, principally grains and meats, during the 1945-55 period was under complete control of the Government Agency, the Argentine Trade Promotion Institute (IAPI). Commodity prices were fixed at very low levels in relation to world prices and were bought by the State trading monopoly and sold on the world market. This resulted in substantial monetary surpluses that were diverted into the industrial sector. However, the program had the negative effect of reducing producer

TABLE 2-- COMPETITION FOR ACREAGE PLANTED TO CROPS IN ARGENTINA  
[ In thousands of hectares ]

Year	Wheat	Corn	Grain sorghum	Small grains <sup>1</sup>	Total grain	Linseed	Sunflower	Peanut
1955-56 ....	5,210.0	2,887.9	138.8	2,510.6	10,747.3	674.6	1,396.9	204.6
1956-57 ....	5,947.1	2,740.4	178.8	3,214.7	12,081.0	1,285.4	1,201.0	226.2
1957-58 ....	5,310.9	2,860.0	418.0	2,602.4	11,191.3	1,447.3	1,647.6	248.1
1958-59 ....	5,707.6	2,894.4	682.0	2,756.5	12,040.5	1,202.1	1,339.3	283.8
1959-60 ....	4,792.4	3,062.0	730.0	3,021.2	11,605.6	1,227.5	1,250.0	200.4
Average ...	5,393.6	2,888.9	429.5	2,821.0	11,533.1	1,167.4	1,366.9	232.6
1960-61 ....	4,274.8	3,222.0	935.8	2,219.7	10,653.3	1,129.1	1,122.0	200.6
1961-62 ....	4,952.2	3,300.0	1,074.5	2,032.7	11,359.4	1,306.9	1,351.0	288.5
1962-63 ....	4,874.3	3,420.0	1,071.5	1,061.3	10,427.1	1,502.6	983.0	279.3
1963-64 ....	6,276.0	3,778.0	1,218.4	2,043.4	13,315.8	1,408.8	873.0	362.0
1964-65 ....	6,496.7	3,693.0	1,246.0	1,895.5	13,331.2	1,171.8	1,172.6	388.5
Average ...	5,374.8	3,482.6	1,109.4	1,850.5	11,817.4	1,303.8	1,100.3	303.8
1965-66 ....	5,425.5	3,921.3	1,345.5	1,135.4	11,827.7	1,294.0	1,183.3	351.1
1966-67 ....	6,291.2	4,156.5	1,453.7	1,243.4	13,144.8	923.9	1,362.3	335.3
1967-68 ....	6,613.0	4,473.4	1,841.3	1,579.5	14,507.2	711.3	1,194.3	294.4
1968-69 ....	6,679.5	4,595.4	2,151.2	1,586.0	15,012.1	878.6	1,354.0	253.5
1969-70 ....	6,238.7	4,665.6	2,567.5	1,313.5	14,785.3	952.0	1,472.3	215.1
Average ...	6,249.6	4,362.4	1,871.8	1,371.5	13,855.4	951.9	1,313.2	290.0
1970-71 ....	4,201.2	4,993.0	3,121.6	897.5	13,213.2	973.3	1,614.2	314.0

Year	Total oilseeds <sup>2</sup>	Alfalfa	Small grains <sup>3</sup>	Sudan grass	Sugared sorghum	Garani sorghum	Total forage <sup>3</sup>	Total grains and oilseeds	Total acreage
1955-56 ....	2,276.1	7,302.0	2,769.7	449.0	262.0 <sup>4</sup>	450.0	11,204.6	13,023.4	24,228.0
1956-57 ....	2,712.6	7,438.0	2,874.6	414.2	233.9 <sup>4</sup>	450.0	11,438.8	14,793.6	26,232.4
1957-58 ....	3,343.0	7,397.0	3,549.6	443.0	354.0	437.0	12,180.6	14,534.3	26,714.9
1958-59 ....	2,925.2	7,087.0	3,239.3	525.0	308.5	333.0	11,492.8	14,865.7	26,358.5
1959-60 ....	2,677.9	7,203.0	2,816.5	556.1	318.7	260.5	11,154.8	14,283.5	25,438.3
Average ...	2,766.9	7,285.4	3,050.0	477.5	295.4	386.1	11,494.3	14,300.1	25,794.4
1960-61 ....	2,451.7	7,110.0	3,204.1	464.4	375.1	186.6	11,476.2	13,105.0	24,581.2
1961-62 ....	2,946.4	7,170.0	3,235.6	607.6	402.0	176.1	11,591.3	14,305.8	25,897.1
1962-63 ....	2,764.9	6,450.1	3,668.0	562.2	562.4	121.7	11,364.4	13,192.0	24,556.4
1963-64 ....	2,643.8	6,444.0	2,574.5	563.0	590.5	122.1	10,294.1	15,959.6	26,253.7
1964-65 ....	2,732.9	6,060.0	2,270.0	565.3	590.0	103.6	9,588.9	16,064.1	25,653.0
Average ...	2,707.9	6,646.8	2,997.6	572.0	504.0	142.0	10,863.0	14,525.3	25,388.3
1965-66 ....	2,828.4	5,921.3	3,026.0	560.3	646.7	96.2	10,250.5	14,656.1	24,906.6
1966-67 ....	2,621.5	5,699.0	3,103.6	578.9	703.0	90.3	10,174.8	15,766.3	25,941.1
1967-68 ....	2,200.0	5,660.0	2,781.5	545.2	796.8	89.3	9,782.8	16,707.2	26,490.7
1968-69 ....	2,486.1	5,858.0	3,223.8	594.4	835.7	87.8	10,599.7	17,498.2	28,097.9
1969-70 ....	2,639.4	5,468.4	3,249.6	631.7	921.5	77.7	10,348.9	17,424.7	27,773.6
Average ...	2,555.1	5,721.3	3,076.9	582.1	780.7	88.3	10,231.3	16,410.4	26,641.7
1970-71 ....	2,901.5	4,362.3	2,918.1	638.0	1,047.2	113.5	9,079.1	16,114.8	25,193.9

<sup>1</sup> Includes barley, oats, and rye acreage that was harvested for grain.

<sup>2</sup> Includes the three major oilseeds--linseed, sunflower and peanut.

<sup>3</sup> Includes alfalfa, small grains not harvested for grain, sudan grass, sugared sorghum, and garani sorghum.

<sup>4</sup> Estimate.



incentives, resulting in lower agricultural output levels. This reduced agricultural exports and contributed to a negative balance of trade in 9 out of 12 years from 1951 to 1962.

Since 1962, agricultural production has been increasing to meet rising domestic consumption require-

ments and foreign exchange needs. This has been the result of substantial increases in acreage of the major grains — wheat, corn, and grain sorghum — and sunflowerseed, as well as increased cattle slaughter. Increased supplies have contributed to a consistent favorable balance of trade since 1962.

TABLE 3—ARGENTINE OILSEED<sup>1</sup> ACREAGE AND PRODUCTION BY PROVINCES

Item	Total	Buenos Aires	Cordoba	Corrientes	Chaco	Entre Rios
Area planted:	1,000 hectares	1,000 hectares	1,000 hectares	1,000 hectares	1,000 hectares	1,000 hectares
1960-61 . . . .	2,452.7	1,004.2	646.1	7.5	7.2	382.9
1961-62 . . . .	2,956.7	1,100.5	860.6	7.9	29.9	468.7
1962-63 . . . .	2,786.0	929.4	697.0	6.0	40.9	541.7
1963-64 . . . .	2,657.5	878.8	602.5	2.8	23.4	615.9
1964-65 . . . .	2,750.5	927.5	694.1	4.0	57.6	452.8
1965-66 . . . .	2,843.0	1,000.4	641.5	6.6	82.3	564.5
1966-67 . . . .	2,640.0	1,026.5	620.8	7.2	94.3	394.0
1967-68 . . . .	2,222.8	954.3	503.3	4.5	94.7	232.5
1968-69 . . . .	2,516.9	1,182.1	569.2	4.9	75.4	264.8
1969-70 . . . .	2,666.9	1,331.1	525.9	5.9	60.5	304.0
Average . . . .	2,649.6	1,033.5	636.1	5.7	56.6	422.2
1970-71 . . . .	2,939.2	1,425.2	536.4	14.0	153.9	312.7
Production:	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons
1960-61 . . . .	1,414.0	527.0	475.5	3.1	4.7	176.8
1961-62 . . . .	2,122.2	692.1	773.3	2.9	24.6	299.6
1962-63 . . . .	1,631.5	510.5	461.1	4.9	23.5	311.3
1963-64 . . . .	1,578.0	523.6	410.9	1.0	16.3	324.4
1964-65 . . . .	2,028.3	652.1	660.9	3.0	64.5	229.2
1965-66 . . . .	1,780.8	755.3	511.1	2.9	26.2	235.0
1966-67 . . . .	2,071.5	887.3	516.0	5.4	96.9	180.2
1967-68 . . . .	1,629.8	700.1	414.2	3.4	74.4	80.6
1968-69 . . . .	1,634.8	727.3	403.7	4.3	29.2	167.9
1969-70 . . . .	2,041.3	1,126.9	362.8	5.7	39.5	205.8
Average . . . .	1,793.2	710.2	499.0	3.7	40.0	221.1
1970-6 . . . .	1,956.6	770.6	494.0	10.7	55.7	273.2

<sup>1</sup>Includes sunflowerseed, peanut, linseed, and soybean. Cottonseed was not included because it is a by-product of cotton production and therefore competes for acreage with other types of agricultural products under different circumstances than oilseeds.

De La Bolsa de Cereales, Numero Estadístico, 1970 and 1971.

TABLE 3--ARGENTINE OILSEED<sup>1</sup> ACREAGE AND PRODUCTION BY PROVINCE--Continued

Item	Formosa	La Pampa	Misiones	Salta	San Luis	Santa Fe	Tucuman
	1,000 hectares	1,000 hectares	1,000 hectares	1,000 hectares	1,000 hectares	1,000 hectares	1,000 hectares
Area planted:							
1960-61 . . . .	0.1	5.1	1.4	—	12.8	382.4	0.3
1961-62 . . . .	0.5	8.7	1.4	—	15.0	458.2	1.8
1962-63 . . . .	4.9	20.9	1.5	—	17.5	522.5	1.8
1963-64 . . . .	4.2	17.1	1.7	0.4	18.5	488.8	1.5
1964-65 . . . .	5.9	18.9	8.5	1.1	27.9	544.7	5.0
1965-66 . . . .	8.7	11.4	8.9	1.4	22.4	485.1	6.8
1966-67 . . . .	4.4	10.5	9.9	1.0	25.4	435.0	7.6
1967-68 . . . .	3.1	8.6	11.3	1.3	23.5	373.5	10.5
1968-69 . . . .	2.1	8.3	13.7	1.2	25.2	354.3	15.1
1969-70 . . . .	1.7	6.7	13.8	.7	25.3	385.1	7.7
Average . . . .	3.6	11.6	7.2	.7	21.4	443.0	5.8
1970-71 <sup>1</sup> . . .	1.5	13.3	16.6	.6	28.6	418.6	16.9
	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons
Production:							
1960-61 . . . .	0.1	0.6	1.3	—	5.3	218.5	0.2
1961-62 . . . .	1.3	1.4	1.3	—	14.8	308.2	2.7
1962-63 . . . .	5.9	3.3	1.3	—	6.6	300.5	2.0
1963-64 . . . .	3.2	2.0	1.0	1.6	3.5	288.6	1.4
1964-65 . . . .	3.4	3.7	9.6	1.1	18.4	377.4	4.0
1965-66 . . . .	2.5	1.9	10.2	1.5	6.6	221.3	6.4
1966-67 . . . .	3.4	1.8	11.4	.9	17.5	342.3	7.2
1967-68 . . . .	2.2	2.1	7.7	1.0	13.3	318.2	12.4
1968-69 . . . .	1.7	3.3	10.1	1.6	13.6	253.1	18.9
1969-70 . . . .	1.1	2.7	12.3	1.8	17.5	259.7	6.1
Average . . . .	2.4	2.1	6.6	0.8	11.7	288.8	6.1
1970-71 . . . .	1.0	5.0	29.0	0.6	13.2	285.8	17.3

## OILSEED PRODUCTION PATTERNS

Acreage planted to oilseeds generally constitutes about 10 percent of total land sown to crops (Table 2).

Sunflowerseed, linseed, and peanuts, constitute the major oilseed crops and are extensively cultivated throughout the Pampa region. Here they compete for land with grain and forage crops, both of which are more widely cultivated, constituting over 80 percent of total land devoted to crops.

Other oil-bearing materials grown in Argentina include soybeans, rapeseed, tung nuts, and olives. Also, a significant amount of cottonseed is harvested from the cotton acreage sown in the north, primarily in Chaco Province. Cottonseed acreage is generally not included in total oilseed acreage, however, as the crop is planted primarily for the fiber-yielding cottonseed as a byproduct.

Thus, acreage is influenced by different supply-demand considerations outside the oilseed market when the farmer is deciding between planting alternatives.

Over the last 10 years, area planted to oilseeds, excluding cottonseed, averaged over 2.6 million (Table 3). Just under 40 percent of this total was planted in the Province of Buenos Aires, the major oilseed producing area. The other major producing Provinces, in order of importance, were Cordoba, 24 percent of planted oilseed acreage; Santa Fe, 17 percent; and Entre Rios, 16 percent. The remaining 3 percent were planted primarily in Provinces to the north and west.

Argentine farmers, in efforts to increase income, have gradually shifted sunflower acreage from a first to a second crop. Wheat is harvested and then the sunflower is planted on the same acreage. In 1970, the Argentine Government estimated that 60 percent of total sunflower acreage was in areas previously planted to wheat. Private estimates even place 70 percent of the sunflower crop on land just harvested for grains, primarily wheat. The second-cropping trend has increased farm income and reduced income risks. However, sunflowerseed as a second crop is less disease-resistant and reportedly has a lower oil content. In addition, yields have been reported to be lower, at 500-600 kilo grams per hectare. Thus, wheat first is a hedge against low returns from the sunflower crop.

### Major Oilseed Producing Areas

Sunflowerseed is the major oilseed grown for edible oil purposes and supplies most of the domestic edible oil requirements (Table 4). It is grown primarily in the central part of the Pampa, encompassing most of north-central Buenos Aires Province and all of southern Santa Fe Province. Around 55 percent of sunflowerseed acreage is located in Buenos Aires Province, 18 percent in Santa Fe Province, and over 10 percent in Cordoba Province, with the rest scattered in smaller areas to the north.

Until the early forties, when sunflowerseed became a major oilseed crop Argentina used imported olive oil. By the mid-forties, acreage had grown to around 1.6 million hectares, but it stayed at that level until the 1951-52 crop year, at which time it fell sharply. Since then, acreage planted to sunflowerseed has gone through cyclic fluctuations. Acreage hit lows in the mid-fifties and the mid-sixties, dipping well below a million hectares. Since the 1963-64 crop year, however, acreage has been on a rising trend, and in 1970-71, it appeared to be back up to the 1.6-million hectare level reached in the forties.

Flaxseed is the major oilseed grown for non-food uses. It is primarily an export crop, as until recently, there has been very little domestic demand for either the oil or the meal. Linseed is grown in the Pampa in fairly well-defined belts. (Table 3). One such belt extends through southern Buenos Aires Province in a predominantly wheat-growing area. The second belt is to the north extending through central Cordoba and Santa Fe Provinces and all of Entre Rios Province, and is the principal growing region, containing about 60 percent of total acreage.

Acreage planted to linseed increased steadily from the beginning of the century and reached a peak of around 3 million hectares in 1930. There it remained until the early forties, when planted acreage began to decline. It plummeted sharply during the Peron administration, when agriculture was particularly depressed, reaching a low of around 700,000 hectares in the mid-fifties. It then began to recover and reached a 1.5 million hectare level in the 1962-63 crop year.

Since then, however, acreage devoted to linseed has declined owing to excess supplies and low prices on the world markets, influencing prices on the

TABLE 4--ARGENTINE SUNFLOWERSEED ACREAGE, YIELD, PRODUCTION, BY PROVINCE

Item and year beginning April 1	Total	Buenos Aires	Cordoba	Corrientes	Chaco	Entre Rios
Area planted:	<i>1,000 hectares</i>	<i>1,000 hectares</i>	<i>1,000 hectares</i>	<i>1,000 hectares</i>	<i>1,000 hectares</i>	<i>1,000 hectares</i>
1960-61 ....	1,122.0	684.7	225.0	1.2	6.4	22.1
1961-62 ....	1,351.0	749.0	0.8	316.3	29.0	27.2
1962-63 ....	983.0	577.0	147.0	0.1	40.0	31.1
1963-64 ....	873.0	528.0	95.0	0.2	22.4	34.7
1964-65 ....	1,172.6	591.9	142.5	1.2	56.6	49.7
1965-66 ....	1,181.3	626.9	129.6	3.1	81.3	66.7
1966-67 ....	1,362.3	704.3	151.9	2.0	93.9	90.0
1967-68 ....	1,194.3	634.8	156.5	0.3	93.9	47.2
1968-69 ....	1,354.0	788.1	205.8	0.4	75.0	39.3
1969-70 ....	1,472.3	865.6	234.2	0.5	60.3	29.0
Average ...	1,206.6	675.0	180.4	1.0	55.9	43.7
1970-71 ....	1,614.2	899.6	224.3	3.0	153.5	17.6
Yield per hectare:	<i>Kg.</i>	<i>Kg.</i>	<i>Kg.</i>	<i>Kg.</i>	<i>Kg.</i>	<i>Kg.</i>
1960-61 ....	651	651	632	600	772	660
1961-62 ....	718	711	669	615	967	648
1962-63 ....	611	622	523	775	726	633
1963-64 ....	628	627	461	762	781	651
1964-65 ....	746	747	656	909	1,196	566
1965-66 ....	765	859	628	376	575	469
1966-67 ....	902	913	825	611	1,084	532
1967-68 ....	891	879	754	476	845	468
1968-69 ....	737	748	692	526	496	608
1969-70 ....	846	903	599	958	774	643
Average ..	750	766	644	661	822	588
1970-71 ....	632	628	581	729	531	721
Production:	<i>1,000 metric tons</i>	<i>1,000 metric tons</i>	<i>1,000 metric tons</i>	<i>1,000 metric tons</i>	<i>1,000 metric tons</i>	<i>1,000 metric tons</i>
1960-61 ....	585.0	345.0	120.0	0.4	4.2	12.7
1961-62 ....	860.0	458.0	195.0	0.4	24.1	16.6
1962-63 ....	462.0	267.0	57.0	0.1	23.0	17.7
1963-64 ....	460.0	285.0	30.8	0.2	15.8	21.6
1964-65 ....	757.0	378.4	81.2	1.0	63.9	22.8
1965-66 ....	782.0	495.0	76.4	0.8	26.0	27.3
1966-67 ....	1,120.0	580.0	121.4	1.1	96.7	39.8
1967-68 ....	940.0	482.0	106.0	0.1	74.0	19.0
1968-69 ....	876.0	506.0	132.9	0.2	29.0	22.3
1969-70 ....	1,140.0	743.3	120.6	0.2	39.4	17.5
Average ..	798.2	454.0	104.1	0.5	39.6	21.7
1970-71 ....	830.0	248.0	117.0	2.1	55.4	11.4

TABLE 4---ARGENTINE SUNFLOWERSEED ACREAGE, YIELD, AND PRODUCTION BY PROVINCES--Continued

Item and year beginning April 1	Formosa	La Pampa	Salta	San Luis	Santa Fe	Santiago del Estero	Tucuman
Area planted:	1,000 hectares	1,000 hectares	1,000 hectares	1,000 hectares	1,000 hectares	1,000 hectares	1,000 hectares
1960-61 ....	—	2.6	—	12.8	165.7	1.5	—
1961-62 ....	0.4	3.2	—	15.0	208.5	1.6	—
1962-63 ....	4.8	10.5	—	16.2	155.0	1.3	—
1963-64 ....	4.1	12.6	—	18.5	156.0	1.5	—
1964-65 ....	5.8	15.6	0.5	27.0	278.0	1.7	2.1
1965-66 ....	8.4	7.7	1.0	21.6	229.4	2.4	3.2
1966-67 ....	3.9	7.7	.5	25.1	275.9	3.3	3.8
1967-68 ....	2.7	6.4	.2	23.5	225.0	1.6	2.2
1968-69 ....	1.2	5.6	.4	25.2	211.8	.6	.6
1969-70 ....	.9	4.5	—	25.3	250.4	1.0	.6
Average ..	3.2	7.6	.3	21.0	215.6	1.7	1.2
1970-71 ....	1.3	13.1	—	28.6	270.0	1.0	2.2
Yield per hectare:	Kg.	Kg.	Kg.	Kg.	Kg.	Kg.	Kg.
1960-61 ....	—	400	—	585	680	495	769
1961-62 ....	450	344	—	1,075	772	582	600
1962-63 ....	1,193	465	—	637	600	568	875
1963-64 ....	751	347	—	507	692	551	1,000
1964-65 ....	566	452	769	870	722	508	880
1965-66 ....	578	398	1,011	641	721	497	889
1966-67 ....	751	417	894	866	972	728	873
1967-68 ....	672	512	1,111	640	1,159	286	657
1968-69 ....	667	650	1,250	673	844	313	833
1969-70 ....	722	652	—	785	915	526	925
Average ..	706	454	1,007	728	808	505	830
1970-71 ....	775	613	—	620	723	701	705
Production:	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons
1960-61 ....	—	0.4	—	5.3	96.5	0.5	—
1961-62 ....	0.2	.1	—	14.8	150.1	.7	—
1962-63 ....	5.7	2.9	—	6.4	81.6	.6	—
1963-64 ....	3.1	1.6	—	3.5	97.7	.7	—
1964-65 ....	3.3	3.0	0.3	17.4	183.4	.9	1.4
1965-66 ....	2.4	.4	1.9	6.2	143.0	.9	2.7
1967-67 ....	2.9	.4	.4	17.5	254.5	2.2	3.3
1967-68 ....	1.8	1.5	.2	13.3	240.5	.2	1.4
1968-69 ....	.8	2.6	.5	13.6	167.5	.1	.5
1969-70 ....	.6	2.2	—	17.5	197.9	.7	.4
Average ..	2.1	1.5	.2	11.6	161.3	.7	1.0
1970-71 ....	.9	5.0	—	13.2	175.0	.5	1.5

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domestic market. However, this decline in acreage has been limited to the northern linseed belt. Acreage in southern Buenos Aires has increased since there are fewer production alternatives.

Peanut planting is also confined to a rather limited production area primarily in the central part of Cordoba Province (Table 6). Acreage planted to peanuts has been on a consistent rising trend, reaching 100,000 hectares in the forties, 200,000 in the fifties, and 300,000 in the sixties. It has been the only oilseed to show such a consistent rising trend. This is due to the higher returns versus other competing crops and the rather specialized nature of peanut production versus the other grain and oilseed crops.

Soybean production, while minor compared with sunflower and peanut output, has increased steadily in the past decade (Table 7). Production is located primarily on small farms in the northern parts of Misiones, Santa Fe, and Tucuman. However, it is now moving into the Pampa in southern Santa Fe and northern Buenos Aires.

Acreage planted to soybeans was relatively insignificant until 1960, averaging below a thousand hectares. At that time, acreage increased to over 10,000 hectares and has since risen to over 30,000.

Cottonseed, although a byproduct of cotton, influences the oilseed market. Cotton acreage is located in the north, principally in Chaco Province, where over

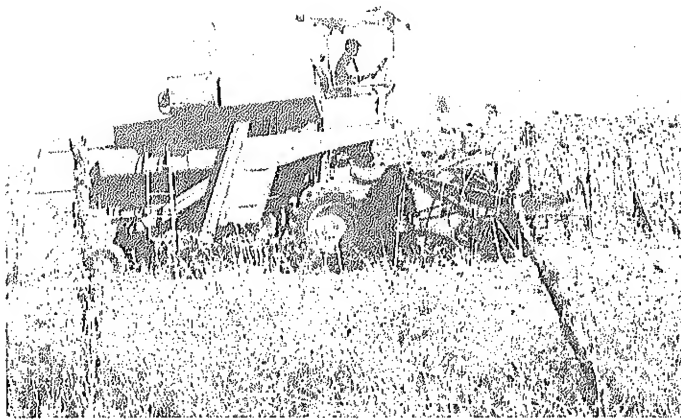
TABLE 5— ARGENTINE FLAXSEED ACREAGE YIELD AND PRODUCTION BY PROVINCE

Item and year beginning Nov. 1	Total	Buenos Aires	Cordoba	Corrientes	Entre Rios	La Pampa	San Luis	Santa Fe	Santiago del Estero
	1,000 hectares	1,000 hectares	1,000 hectares	1,000 hectares	1,000 hectares	1,000 hectares	1,000 hectares	1,000 hectares	1,000 hectares
Area planted:									
1960-61 ....	1,129.1	319.5	222.9	6.1	360.7	2.5	—	216.2	1.2
1961-62 ....	1,306.9	351.4	254.9	7.0	441.5	5.5	—	245.0	1.6
1962-63 ....	1,502.6	348.4	274.6	4.0	509.7	10.4	1.3	353.6	.6
1963-64 ....	1,408.8	344.5	148.8	2.1	581.2	4.5	—	327.3	.4
1964-65 ....	1,171.8	333.3	167.9	2.6	402.5	3.3	—	262.0	.2
1965-66 ....	1,294.0	372.0	165.6	3.4	497.6	3.7	—	251.3	.4
1966-67 ....	923.9	320.3	137.6	4.5	302.6	2.8	—	155.8	.3
1967-68 ....	711.3	318.2	56.2	3.5	185.3	2.2	—	145.9	—
1968-69 ....	878.6	392.6	114.0	4.4	225.5	2.7	—	139.4	—
1969-70 ....	952.0	464.2	80.5	4.6	275.0	2.2	—	125.5	—
Average ....	1,127.9	356.4	162.3	4.2	378.2	4.0	.1	222.2	.5
1970-71 ....	973.3	524.2	12.0	4.9	295.0	.2	—	137.0	—
Yield per hectare:	Kg.	Kg.	Kg.	Kg.	Kg.	Kg.	Kg.	Kg.	Kg.
1960-61 ....	587	671	548	500	510	333	—	638	400
1961-62 ....	698	756	635	385	704	419	—	685	364
1962-63 ....	638	840	452	648	605	339	833	631	227
1963-64 ....	634	763	475	450	595	391	—	626	286
1964-65 ....	752	856	925	780	578	389	—	762	389
1965-66 ....	568	746	435	714	500	384	—	423	133
1966-67 ....	721	1,027	443	767	530	422	—	625	200
1967-68 ....	625	762	629	838	415	476	—	560	—
1968-69 ....	630	600	571	952	695	467	—	647	—
1969-70 ....	809	902	346	870	780	385	—	616	—
Average ....	666	792	546	690	591	401	—	621	286
1970-71 ....	816	754	400	866	942	400	—	749	—
Production:	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons
1960-61 ....	562.0	182.0	91.5	2.6	164.0	0.2	—	121.3	0.4
1961-62 ....	818.0	234.0	144.0	2.5	283.0	1.3	—	153.0	.2
1962-63 ....	838.6	238.9	95.8	2.4	293.4	.4	0.2	207.4	.1
1963-64 ....	771.0	231.1	49.4	.6	302.8	1.0	—	186.0	.1
1964-65 ....	815.0	271.5	143.8	1.9	206.2	.7	—	190.8	.1
1965-66 ....	570.0	258.5	47.2	2.0	207.6	.5	—	74.2	—
1966-67 ....	577.0	305.0	44.3	3.3	140.0	.4	—	84.0	—
1967-68 ....	385.0	216.6	28.8	2.8	61.6	.6	—	74.6	—
1968-69 ....	510.0	219.5	57.7	4.0	145.6	.7	—	82.5	—
1969-70 ....	640.0	382.0	11.0	4.0	188.3	.5	—	54.2	—
Average ....	648.7	253.9	69.4	2.6	199.3	.6	—	122.8	.1
1970-71 ....	680.0	321.0	1.0	4.2	261.7	—	—	92.1	—

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*Left, sunflowerseed arrives at factory for crushing. Below, harvesting sunflowerseed with specialized equipment; right, a diseased sunflower field, a perennial problem resulting from weakening of plants after double-cropping with wheat.*



*Bottom left, peanuts in Santa Fe Province—their major producer—are delivered to crushing plant: right, drying of raw cotton for the seed.*

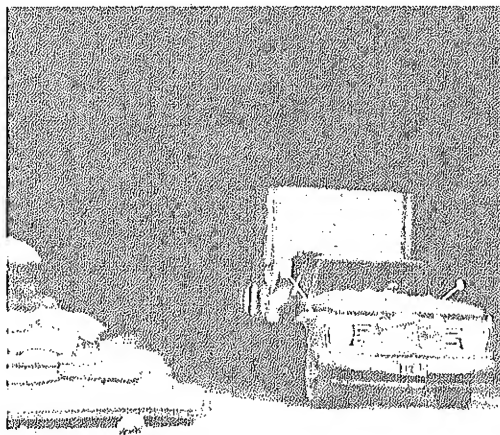


TABLE 6-- ARGENTINE PEANUT ACREAGE, YIELD, AND PRODUCTION, BY PROVINCE

Item and marketing year beginning April 1	Buenos Aires	Cordoba	Corrientes	Chaco	Entre Rios	Formosa	Misiones	Salta	San Luis	Santa Fe	Tucuman	Total
	1,000 hectares	1,000 hectares	1,000 hectares	1,000 hectares	1,000 hectares	1,000 hectares	1,000 hectares	1,000 hectares	1,000 hectares	1,000 hectares	1,000 hectares	1,000 hectares
Area planted:												
1960	—	198.2	0.2	0.8	0.1	0.1	0.4	—	—	0.5	0.3	200.6
1961	—	286.0	.1	.9	—	.1	.4	—	—	.7	.3	288.5
1962	—	274.6	1.9	.9	—	.1	.4	—	—	1.0	.4	279.5
1963	0.2	357.9	.5	1.0	—	.1	.4	0.4	—	1.1	.4	362.0
1964	—	383.7	.2	1.0	.2	.1	.4	.5	0.9	.5	1.0	388.5
1965	—	346.3	.1	1.0	—	.3	.4	.4	.8	.4	1.4	351.1
1966	—	331.3	.7	.4	—	.2	.5	.3	.3	.2	1.4	335.3
1967	—	290.6	.1	.4	—	.2	.5	.8	—	.5	1.5	294.4
1968	—	249.4	.1	.3	—	.6	.5	.6	—	.4	1.9	253.5
1969	—	211.2	.8	—	—	.6	.5	.3	—	.4	1.3	215.1
Average	—	292.9	.5	.7	—	.2	.4	.3	.2	.5	1.0	296.8
1970	—	300.1	4.5	—	.1	.2	.5	.2	—	1.1	7.3	314.0
Yield per hectare:	Kg.	Kg.	Kg.	Kg.	Kg.	Kg.	Kg.	Kg.	Kg.	Kg.	Kg.	Kg.
1960	—	1,410	606	712	727	1,450	771	1,167	—	1,861	957	1,405
1961	—	1,552	653	682	—	1,069	759	1,261	—	1,763	1,424	1,549
1962	—	1,174	1,296	555	857	1,478	722	1,333	—	1,294	1,127	1,172
1963	700	968	513	553	735	987	703	1,345	—	1,277	730	967
1964	—	1,164	670	620	421	651	793	1,523	1,054	908	623	1,161
1965	—	1,235	800	472	500	889	795	1,541	769	1,565	1,094	1,233
1966	—	1,081	1,449	564	500	1,059	767	1,200	—	1,250	1,125	1,081
1967	—	984	750	530	667	1,000	775	1,129	—	1,467	1,000	985
1968	—	890	667	473	571	938	722	1,250	—	1,095	974	891
1969	—	1,116	1,268	—	800	469	800	1,160	—	1,200	1,056	1,114
Average	—	1,157	867	517	643	999	761	1,291	912	1,368	1,011	1,156
1970	—	1,261	790	—	714	585	675	1,314	—	1,700	1,000	1,251
Production:	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons
1960	—	264.0	0.1	0.5	0.1	0.1	0.3	—	—	0.7	0.2	266.0
1961	—	430.5	—	.5	—	.1	.3	—	—	1.1	.5	433.0
1962	—	307.2	2.4	.5	—	.2	.3	—	—	1.1	.3	312.0
1963	.1	529.3	.2	.5	—	.1	.3	0.6	—	1.2	.2	533.0
1964	—	435.9	.1	.6	—	.1	.3	.7	1.0	.2	.4	439.3
1965	—	407.5	.1	.2	—	.1	.3	.6	.4	.3	1.3	410.8
1966	—	350.3	1.0	.2	—	.2	.3	.4	—	.2	1.4	354.0
1967	—	279.4	—	.2	—	.2	.3	.7	—	.5	1.5	282.8
1968	—	213.1	.1	.1	—	.6	.3	.8	—	.1	1.9	217.0
1969	—	231.2	.9	—	—	.3	.4	.3	—	.4	1.0	234.5
Average	—	324.9	.5	.3	—	.2	.3	.4	.1	.6	.9	328.2
1970	—	376.0	2.3	—	.1	.1	.3	.2	—	1.7	6.9	387.6

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TABLE 7--- ARGENTINE SOYBEAN ACREAGE, YIELD, AND PRODUCTION BY PROVINCE

Item and year beginning April 1	Buenos Aires	Cordoba	Corrientes	Chaco	Entre Rios	Formosa	Mendoza	Misiones	Salta	Santa Fe	Tucuman	Santiago del Estero	Total
Area planted:	hectares	hectares	hectares	hectares	hectares	hectares	hectares	hectares	hectares	hectares	hectares	hectares	hectares
1960....	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
1961....	73	3,420	12	—	—	—	—	985	8	3,950	1,500	255	10,260
1962....	4,000	815	—	—	900	—	—	1,100	—	12,895	1,400	—	21,110
1963....	6,050	750	—	—	20	20	—	1,280	—	4,440	1,140	—	13,700
1964....	2,300	—	45	—	402	25	25	8,132	109	4,235	2,312	—	17,560
1965....	1,500	—	—	—	230	—	—	8,545	40	4,000	2,230	—	16,575
1966....	1,850	—	—	—	1,410	265	30	9,360	153	3,050	2,350	—	18,470
1967....	1,320	—	600	390	—	180	35	10,820	340	2,300	6,815	—	22,800
1968....	1,440	—	—	130	—	290	30	13,200	180	2,980	12,550	—	30,800
1969....	1,270	—	600	150	—	195	35	13,300	370	8,800	5,750	—	30,470
Average	1,980	499	126	67	296	93	21	6,774	120	4,665	3,605	26	18,276
1970-71..	1,400	—	1,570	360	—	—	—	16,100	370	10,500	7,400	—	37,700
Yield per hectare:	Kg.	Kg.	Kg.	Kg.	Kg.	Kg.	Kg.	Kg.	Kg.	Kg.	Kg.	Kg.	Kg.
1960....	—	—	—	—	—	—	—	977	—	—	—	—	977
1961....	954	1,208	857	—	—	—	—	1,000	322	1,066	1,497	790	1,163
1962....	1,200	1,292	—	—	371	—	—	955	—	878	1,300	—	972
1963....	1,259	1,200	—	—	667	—	1,500	864	—	982	1,305	—	1,146
1964....	983	—	—	—	649	—	1,400	1,160	852	809	1,079	—	1,035
1965....	1,220	—	—	—	611	—	1,333	1,173	750	1,056	1,204	—	1,147
1966....	1,264	—	—	—	462	1,207	1,562	1,194	806	1,251	1,277	—	1,188
1967....	1,180	—	—	487	—	944	—	865	597	1,109	1,399	—	1,089
1968....	1,250	—	—	692	—	1,172	—	899	1,500	1,068	1,315	—	1,124
1969....	1,260	—	1,105	733	—	842	—	943	1,351	1,152	1,033	—	1,032
Average	1,174	1,233	1,008	637	552	1,041	1,471	1,003	883	1,041	1,268	790	1,087
1970....	1,151	—	1,400	764	—	—	—	1,815	1,149	1,700	1,290	—	1,624
Production:	Metric tons	Metric tons	Metric tons	Metric tons	Metric tons	Metric tons	Metric tons	Metric tons	Metric tons	Metric tons	Metric tons	Metric tons	Metric tons
1960....	—	—	—	—	—	—	—	957	—	—	—	—	957
1961....	62	3,800	6	—	—	—	—	957	1	3,990	2,170	181	11,220
1962....	4,620	1,053	—	—	167	—	—	981	—	10,409	1,690	—	18,920
1963....	7,400	900	—	—	10	30	—	700	—	3,740	1,220	—	14,000
1964....	2,170	—	—	—	240	35	—	9,300	75	2,970	2,210	—	17,000
1965....	1,750	—	—	—	—	40	—	9,900	30	3,770	2,400	—	18,000
1966....	2,300	—	—	—	380	50	—	11,100	50	3,600	2,700	—	20,500
1967....	1,540	—	520	190	—	170	50	7,400	80	3,600	2,700	—	22,000
1968....	1,800	—	—	90	—	340	—	9,800	270	3,000	16,500	—	31,800
1969....	1,600	—	630	110	—	160	—	11,900	500	7,200	4,700	—	26,800
Average	2,324	575	116	39	91	99	21	6,300	101	4,123	4,309	18	18,120
1970....	1,600	—	2,100	275	—	—	—	28,700	425	17,000	8,900	—	59,000

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60 percent of total acreage is planted. Almost all of the remainder is grown in the three bordering Provinces.

Acreage planted to cotton declined during World War II, but afterwards increased steadily until it reached a peak in the 1957-58 crop year of 732,000 hectares. Since then, acreage has declined due to lower prices brought on by the decrease in world demand for cotton because of synthetic fiber substitutes. Also, there has been a scarcity of labor, and farmers are turning to less labor-intensive crops, particularly grains and sunflower. The 1971 acreage dropped to 384,000 hectares, down from over 400,000 in the previous 2 years.

### Production Trends and Yields

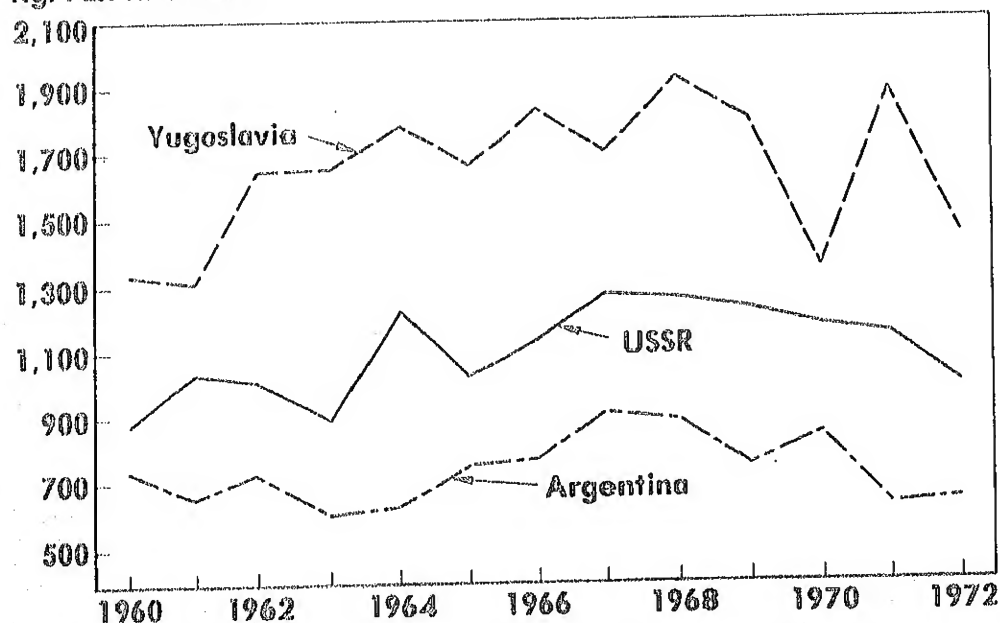
Changes in production of oilseeds have been closely associated with changes in acreage, as yields have not varied greatly from average levels over the last 4 decades. In addition, yields remain around the lowest in the world. Vagaries of weather continue to be a major factor governing yield levels, as can be discerned from year-to-year fluctuations.

Oilseed production, promoted by high prices during World War II, reached 3.0 million tons by the 1943-44 crop year and from that point declined to 1.0 million tons by 1954-55 (Table 8). This reflected the Government's industrialization policy of purchasing oilseeds at low domestic prices and exporting seeds, as well as oils and meals, at much higher world prices. This provided the infant oilseed crushing industry with a cheap raw material and excellent prices for the finished products, creating favorable crushing margins. However, the policy worked to the Government's overall detriment, in that total output was reduced by two-thirds, because of lack of price incentive to producers. With less restrictive price policies beginning in the mid-fifties, oilseed production responded, increasing to well over 2.0 million tons by the sixties.

One other important trend in production became evident over this period. This was the shift out of an inedible oilseeds — flaxseed — into edible oilseeds, primarily sunflowerseed. In 1935, edible oilseeds constituted only 20 percent of total production. By 1945, edible oilseeds constituted half of total production, and from that period of time edible oilseeds

### SUNFLOWERSEED YIELDS PER HARVESTED HECTARE IN ARGENTINA, THE USSR<sup>1/</sup> AND YUGOSLAVIA

Kg. PER HECTARE



<sup>1/</sup> YIELDS BASED ON PLANTED ACREAGE RATHER THAN HARVESTED.

lined the major source of production. By 1970, percentage had grown to 75 percent of the total. Lowerseed was the major edible oilseed, constituting 55 percent of total edible oilseed production.

his switch from inedible to edible oilseeds effected several changes in demand factors. Flaxseed, in the form of linseed oil and meal, was an export. Domestic and price and export volume were more dependent on world demand and production in competing countries. Over this period, there has been a lessening world demand for linseed oil as a drying oil due primarily to the switch from oil-based paints to latex paints. This also resulted in a commensurate buildup in surplus stocks in other major growing countries (primarily the United States and Canada).

Reduced world prices and increased competition in existing markets were translated into lower prices for Argentine farmers, and thus a shift out of oilseed. Production of edible oilseeds, on the other hand, was encouraged by rising domestic and export demand. The increase in domestic demand reflected rising per capita incomes and a switch from animal

fats to vegetable oils. The foreign market offered more than enough outlets to absorb the surpluses of edible oils, particularly sunflowerseed oil, which found a ready market in Western Europe.

As a result, sunflowerseed has rapidly become the most important oilseed produced in Argentina. It supplies almost all the domestic edible oil market and is competitively bid for by exporters. Trends in production have closely followed trends in yields. Yields reached their highest levels in the early forties, averaging close to a thousand kilograms per hectare (Table 9). From this level, yields declined steadily, reaching their lowest level of a little over 600 kilograms per hectare in the late fifties. Acreage increases kept production increasing, despite the declining yields, until the early fifties, when production too began to suffer.

This decline was a result of the depression that overtook agriculture in that period and the lack of inputs applied to sunflower production. Also, plant diseases became a major problem as few new genetic strains were developed and sunflowerseed was cultivated from year to year on the same plots.

## PEANUT YIELDS PER HARVESTED HECTARE IN ARGENTINA, THE UNITED STATES AND NIGERIA

Kg. PER HECTARE

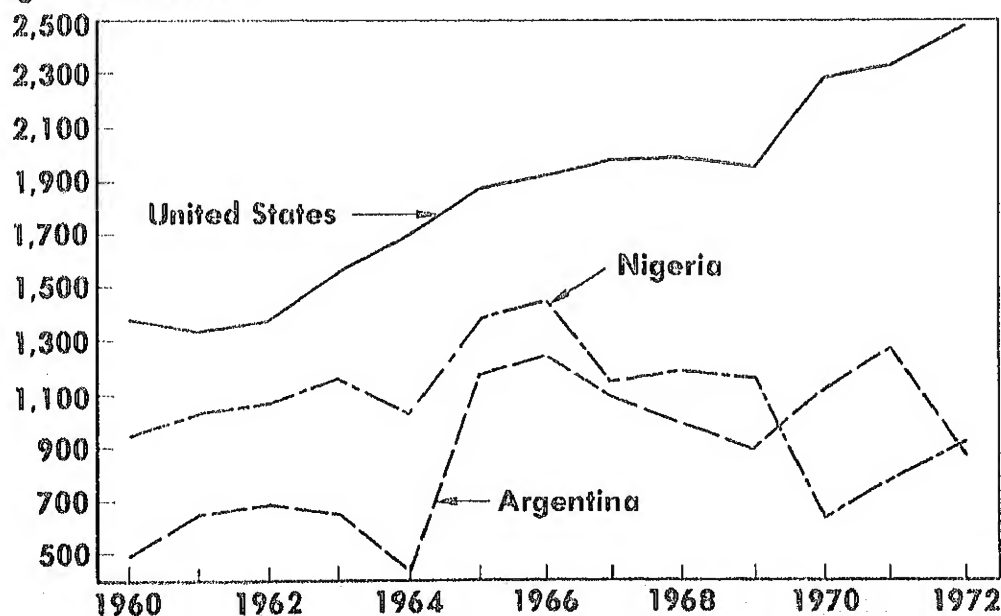


TABLE 8— ARGENTINE PRODUCTION OF OILSEEDS

{ In metric tons}

Crop year	Sunflower	Peanut	Cottonseed	Soybean	Total edible	Total linseed	Total
1935	73,526	113,508	119,658	(1)	386,692	1,510,000	1,896,692
1936 . . . .	103,441	79,346	77,157	(1)	259,944	1,977,862	2,237,806
1937 . . . .	241,005	69,317	127,578	(1)	437,900	1,549,810	1,987,710
1938 . . . .	291,849	40,822	160,257	(1)	492,928	1,447,938	1,940,866
1939 . . . .	375,000	84,395	159,049	(1)	618,444	1,080,400	1,698,844
Average . .	216,964	77,478	144,740		439,181	1,513,202	1,952,383
1940 . . . .	594,000	61,000	93,065	2,468,065	748,065	1,720,000	1,468,065
1941 . . . .	670,000	82,600	155,016	1,241	908,857	1,600,000	2,508,857
1942 . . . .	419,200	96,040	205,350	3,224	723,814	1,347,979	2,107,793
1943 . . . .	1,036,000	198,900	231,457	1,175	1,467,532	1,573,000	3,040,532
1944 . . . .	985,100	158,250	134,695	487	1,278,532	786,000	2,064,532
Average . .	740,840	119,358	163,917	1,225	1,025,360	1,405,396	2,430,756
1945 . . . .	889,969	156,200	118,281	269	1,164,719	964,100	2,128,819
1946 . . . .	688,224	112,800	135,261	572	935,857	1,034,300	1,971,157
1947 . . . .	930,200	104,700	172,881	477	1,208,258	901,000	2,109,258
1948 . . . .	1,088,000	85,150	189,783	362	1,363,295	432,800	1,796,095
1949 . . . .	712,000	60,600	261,960	442	1,035,002	675,800	1,710,802
Average . .	861,679	103,890	175,633	424	1,141,625	801,600	1,943,226
1950 . . . .	1,021,000	93,200	187,079	764	1,301,953	559,200	1,861,153
1951 . . . .	692,000	154,700	238,978	666	1,086,344	313,400	1,399,744
1952 . . . .	428,300	204,000	238,203	1,730	872,233	584,300	1,456,533
1953 . . . .	344,750	169,650	257,829	632	772,361	410,000	1,182,861
1954 . . . .	285,800	118,000	220,577	483	621,860	405,000	1,026,860
Average . .	553,770	147,910	288,553	837	931,050	454,380	1,385,430
1955 . . . .	754,000	216,200	222,321	515	1,193,036	238,000	1,431,036
1956 . . . .	625,000	318,000	200,648	1,430	1,145,078	620,000	1,765,078
1957 . . . .	758,000	290,300	329,905	584	1,379,389	630,000	2,009,389
1958 . . . .	387,000	240,800	181,251	805	809,856	620,000	1,429,856
1959 . . . .	802,000	209,300	165,692	831	1,177,823	825,000	2,009,389
Average . .	665,320	254,920	219,963	833	1,141,036	586,600	1,727,636
1960 . . . .	585,000	266,000	229,160	957	1,081,117	562,000	1,643,117
1961 . . . .	860,000	433,000	200,400	11,220	1,504,620	818,000	2,322,620
1962 . . . .	462,000	312,000	257,330	18,920	1,050,250	838,600	1,868,850
1963 . . . .	460,000	333,000	197,700	14,000	1,004,700	771,000	1,775,700
1964 . . . .	757,000	439,300	266,800	17,000	1,480,100	815,000	4,295,100
Average . .	624,800	356,660	230,278	12,419	1,224,157	760,800	1,984,957
1965 . . . .	782,000	410,800	213,300	18,000	1,424,100	570,100	1,994,100
1966 . . . .	1,120,000	354,000	158,200	20,500	1,655,700	577,000	5,229,700
1967 . . . .	940,000	282,800	138,200	22,000	1,383,000	385,000	1,768,000
1968 . . . .	876,000	217,000	218,300	31,800	1,343,100	510,000	1,853,100
1969 . . . .	1,140,000	234,500	271,600	26,800	1,672,900	640,000	2,312,900
Average . .	771,600	299,820	199,920	23,820	1,495,760	536,400	2,032,160
1970 . . . .	830,000	387,600	166,800	59,000	1,443,400	680,000	2,123,400

<sup>1</sup> Not available.

TABLE 9—ARGENTINE SUNFLOWER ACREAGE, YIELD AND PRODUCTION

Crop year beginning Sept. 1	Planted	Harvested	Yield	5-year moving average	Production
	<i>Hectares</i>	<i>Hectares</i>	<i>Kg. per harvested hectare</i>	<i>Kg. per harvested hectare</i>	<i>Metric tons</i>
1935.....	123,930	98,070	750	—	73,526
1936.....	206,762	156,930	659	—	103,441
1937.....	318,848	279,242	863	—	241,005
1938.....	333,273	269,149	1,084	—	291,849
1939.....	505,600	425,600	881	847	375,000
Average ....	297,682	245,798	847		216,964
1940.....	574,131	540,000	1,100	917	594,000
1941.....	750,000	679,120	987	983	670,000
1942.....	674,000	508,230	825	975	419,200
1943.....	1,573,460	1,258,080	823	923	1,036,000
1944.....	1,491,900	1,133,040	869	921	985,100
Average ...	1,012,698	823,694	921		740,860
1945.....	1,638,510	1,284,364	693	839	889,969
1946.....	1,609,277	1,066,883	645	771	688,224
1947.....	1,532,900	1,266,346	735	753	930,200
1948.....	1,806,255	1,455,047	748	730	1,088,000
1949.....	1,490,800	954,374	746	713	712,000
Average ....	1,615,549	1,205,403	713		861,679
1950.....	1,627,600	1,320,060	773	729	1,021,000
1951.....	1,603,600	1,059,030	653	731	692,000
1952.....	819,570	626,734	683	721	428,300
1953.....	570,500	452,741	761	723	344,750
1954.....	559,040	405,177	608	714	282,800
Average ....	1,036,062	772,748	714		553,770
1955.....	1,396,850	1,091,900	691	697	754,000
1956.....	1,201,000	965,600	647	696	625,000
1957.....	1,647,600	1,306,310	581	676	758,600
1958.....	1,339,300	858,025	451	614	387,000
1959.....	1,250,000	1,093,000	734	621	802,000
Average ....	1,366,950	1,062,967	621		665,320
1960.....	1,122,000	898,300	651	613	585,000
1961.....	1,351,000	1,197,230	718	627	860,000
1962.....	983,000	756,200	611	633	462,000
1963.....	873,000	732,830	628	668	460,000
1964.....	1,172,600	1,015,356	746	671	757,000
Average ....	1,100,320	919,983	671		624,800
1965.....	1,181,300	1,022,650	765	694	782,000
1966.....	1,362,300	1,242,100	902	730	1,120,000
1967.....	1,194,300	1,054,200	891	785	940,000
1968.....	1,354,000	1,189,100	737	808	876,000
1969.....	1,472,300	1,347,400	846	828	1,140,000
Average ....	1,312,840	1,171,090	828		971,600
1970.....	1,614,200	1,313,100	632	802	830,000

The sixties have witnessed a revitalization of yields, rising to over 800 kilograms per hectare. Production likewise rose to a record in 1970 of over 1.1 million tons. Yield levels, however, are far below those of other major producers, such as the USSR, with around 1,300 kilograms per hectare, and Yugoslavia, with over 1,700 per hectare. This reflects the lack of fertilizer usage, persistent disease problems, and seed varieties not well adapted to local conditions.

Current indications are that seed varieties are improving with a resulting increase in yields the last 5 years. However, sunflower as a second crop to wheat poses new problems to increased yield prospects.

Peanut production, on the other hand, has shown a rather consistent rising trend, with smaller relative variation in yields than sunflowerseed (Table 10). Production levels averaged over 100,000 tons by the mid-forties, 200,000 by the late fifties, and 300,000 by the early sixties. Peanut production reached a record production of 439,000 tons in 1965, but over the next 5 years declined dramatically, dipping to 235,000 by 1970.

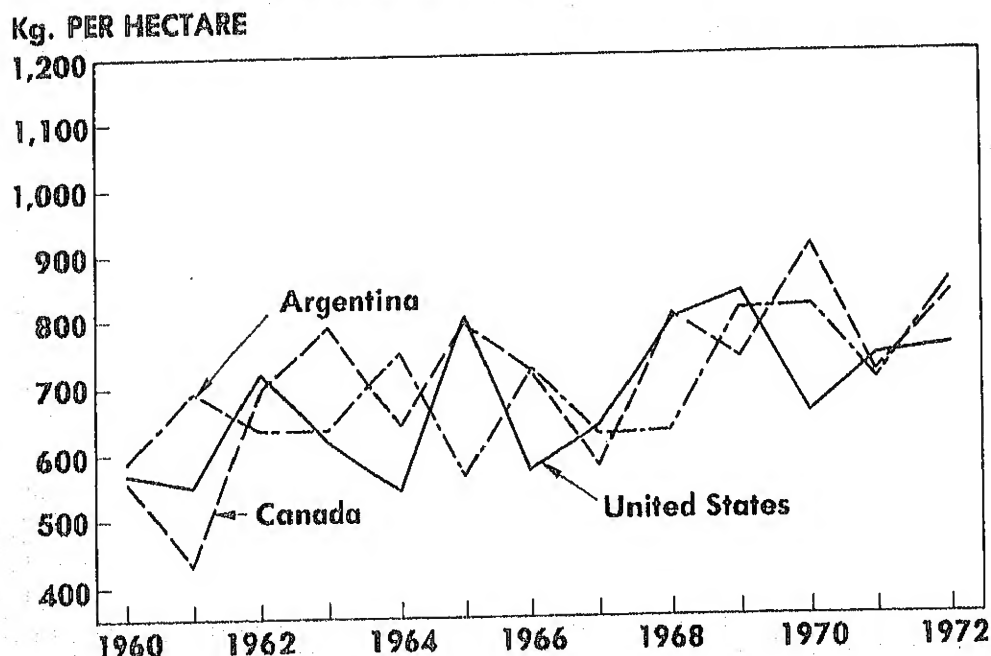
Whether this is a reversal in trend is premature to say, as there seems to be no inclination to take land out of production and plant it to other crops. Also, the 1971 crop is estimated at 400,000 tons, indicating a possible recovery. It would appear that possibly unfavorable weather conditions at planting have been partly responsible for the drop in production.

Peanut yields average around a thousand kilograms per hectare, although from 1960 to 1965 they averaged around 1,200. The 1960 yields were higher than in either the United States or Nigeria. However, by 1969, yields in both the United States and Nigeria had increased, while Argentina's had declined, and yields today are almost twice as high in the United States as in Argentina.

It is difficult to link this decline to the weather. It is more likely due to cultural practices and seed variety; i.e., inadequate fertilizer and disease control, untreated seed, and poor land use with little rotation.

Flaxseed production closely parallels acreage, as average yields have varied little from around 650 kilograms per hectare (Table 11). Production has

## LINSEED YIELDS PER HARVESTED HECTARE IN ARGENTINA, THE UNITED STATES AND CANADA



shown a declining trend, reflecting decreases in world demand, falling from an average of 1.5 million tons in the 1935-40 period to just over 500,000 in 1965-70. There was a slight deviation from this trend during the agricultural depression in the early fifties, when production declined faster than normal.

Argentine flaxseed yields compare favorably with those of the major producer/exporters, — the United States and Canada. During the past decade, yields have fluctuated substantially, and no clear-cut trends have been established in any of the three countries. This may be the result of burdensome supplies overhauling the world markets as a result of a decline in the use of linseed oil.

Flaxseed prices have been under pressure for a number of years. Argentine flaxseed production may further decline in response to world market factors following the 1971 example in the United States and Canada.

Soybean production, though still a minor oilseed representing only 2 percent of total edible oilseed production, has nevertheless greatly expanded during the sixties. Yields on the small acreage that is planted

compare well with those obtained in Brazil — a major exporter — but are well below the world's major producer/exporter, the United States.

The oilseed processors' promotion group — Instituto Agrioindustrial de Oleaginosos (IADO) — is estimating that soybean production will increase to 500,000 metric tons within 3 years to meet expanding needs of the mixed feed industry, whose imports of soybean meal are now growing more rapidly than local production. Assuming a yield of 1 ton per hectare, this would require 270,000 additional hectares planted to soybeans.

There are several underlying factors behind this increased emphasis on soybeans. In Tucuman Province, a sugarbeet production quota, in effect since 1967, has led to a shift from sugarcane to alternative crops, including soybeans. In Misiones, soybean planting has grown in line with tea production, a relatively new crop to the Province. Soybeans are grown here primarily as a cover crop under tea bushes to prevent soil splattering on the tea leaves during heavy rains.

These factors alone, however, will not bring a substantial increase in soybean production—especially

### SOYBEAN YIELDS PER HARVESTED HECTARE IN ARGENTINA, THE UNITED STATES AND BRAZIL

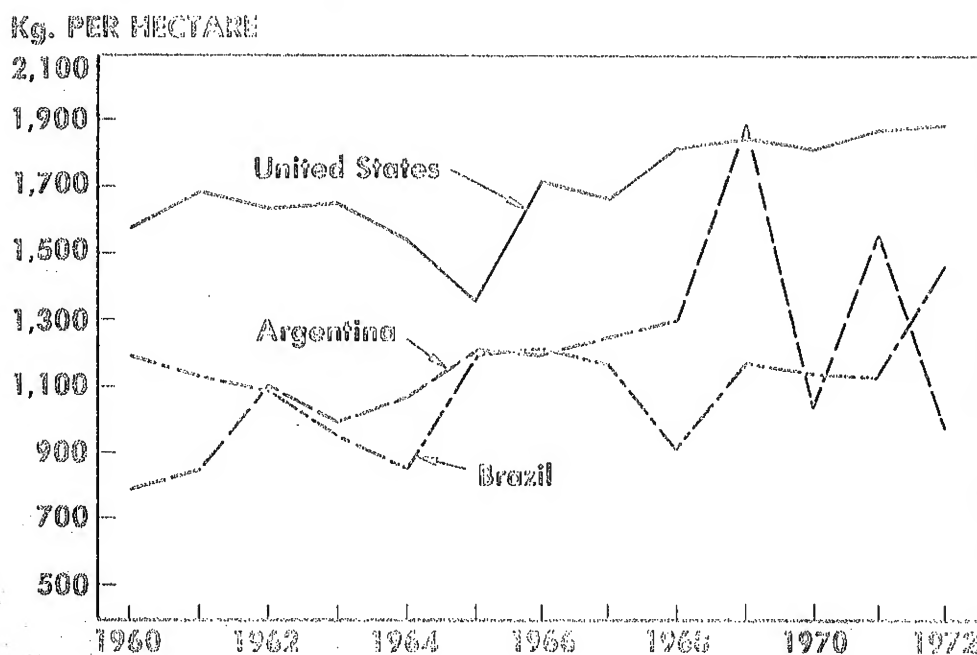


TABLE 10---ARGENTINE PEANUT ACREAGE, YIELD, AND PRODUCTION

Crop year beginning Sept. 1	Planted	Harvested	Yield	5-year moving average	Production
	<i>Hectares</i>	<i>Hectares</i>	<i>Kg. per harvested hectare</i>	<i>Kg. per harvested hectare</i>	<i>Metric tons</i>
1935 .....	98,550	89,050	1,275	—	113,508
1936 .....	127,353	105,319	746	—	79,346
1937 .....	122,439	92,595	749	—	69,317
1938 .....	81,060	48,282	845	—	40,822
1939 .....	89,100	77,118	1,094	942	84,395
Average ....	103,700	82,670	942		77,478
1940 .....	75,000	61,935	985	884	61,000
1941 .....	73,700	67,079	1,232	981	82,600
1942 .....	123,560	109,020	881	1,007	96,040
1943 .....	159,410	145,180	1,370	1,112	198,900
1944 .....	176,700	142,020	1,114	1,116	158,250
Average ....	126,674	105,050	1,116		119,358
1945 .....	182,000	154,040	1,014	1,122	156,200
1946 .....	145,704	113,630	990	1,074	112,800
1947 .....	122,050	107,442	974	1,093	104,700
1948 .....	111,250	94,100	905	1,000	85,150
1949 .....	100,500	76,185	796	936	60,600
Average ....	123,301	109,080	936		103,890
1950 .....	121,150	105,280	885	910	93,200
1951 .....	160,600	141,690	1,092	930	154,700
1952 .....	182,434	175,378	1,163	968	204,000
1953 .....	190,000	181,584	934	974	169,650
1954 .....	157,000	148,791	793	973	118,000
Average ....	162,237	130,560	973		147,910
1955 .....	204,640	195,500	1,106	1,018	216,200
1956 .....	226,180	221,520	1,436	1,086	318,000
1957 .....	248,100	239,630	1,211	1,096	290,300
1958 .....	283,800	259,510	928	1,095	240,800
1959 .....	200,400	189,500	1,104	1,157	209,300
Average ....	232,624	221,130	1,157		254,920
1960 .....	200,600	189,300	1,405	1,217	266,000
1961 .....	288,500	279,580	1,549	1,239	433,000
1962 .....	279,300	266,140	1,172	1,232	312,000
1963 .....	361,700	344,280	967	1,239	333,000
1964 .....	388,500	378,430	1,161	1,251	439,300
Average ....	303,720	291,550	1,251		356,660
1965 .....	351,100	333,300	1,233	1,216	410,800
1966 .....	335,300	327,500	1,081	1,123	354,000
1967 .....	294,400	287,250	985	1,085	282,800
1968 .....	253,500	243,500	891	1,070	217,000
1969 .....	215,100	210,500	1,114	1,061	234,500
Average ....	289,880	280,420	1,061		299,820
1970 .....	314,000	310,000	1,250	1,064	387,600



TABLE 11--ARGENTINE FLAXSEED ACREAGE, YIELD, AND PRODUCTION

Crop year beginning Sept	Planted	Harvested	Yield	5-year moving average	Production
	<i>Hectares</i>	<i>Hectares</i>	<i>Kg. per harvested hectare</i>	<i>Kg. per harvested hectare</i>	<i>Metric tons</i>
1935 .....	2,660,000	2,268,984	665	692	1,510,000
1936 .....	3,499,157	3,086,466	641	685	1,977,862
1937 .....	2,863,525	2,361,000	656	694	1,549,810
1938 .....	2,707,385	2,400,965	603	654	1,447,938
1939 .....	3,075,496	2,179,524	496	612	1,080,400
Average ....	2,961,113	2,459,388	612		1,513,202
1940 .....	2,874,600	2,409,009	714	622	1,720,000
1941 .....	2,730,000	2,321,990	689	632	1,600,000
1942 .....	2,474,090	2,271,160	594	619	1,347,979
1943 .....	2,283,800	2,107,810	780	655	1,573,000
1944 .....	1,995,900	1,253,670	627	681	786,600
Average ....	2,471,678	2,054,728	681		1,405,516
1945 .....	1,864,822	1,383,884	697	677	964,100
1946 .....	1,905,100	1,537,061	673	674	1,034,300
1947 .....	1,573,000	1,340,080	672	690	901,000
1948 .....	1,304,700	386,560	498	633	432,800
1949 .....	1,077,600	959,800	704	649	675,800
Average ....	1,545,044	1,117,877	649		801,600
1950 .....	1,087,400	847,100	660	641	559,200
1951 .....	641,300	448,400	699	647	313,400
1952 .....	1,020,000	869,100	672	746	584,300
1953 .....	732,300	552,300	742	695	410,000
1954 .....	739,300	633,300	640	683	605,000
Average ....	844,060	670,040	683		454,380
1955 .....	674,600	444,000	536	658	238,000
1956 .....	1,285,400	1,077,000	576	633	620,000
1957 .....	1,447,300	1,075,200	586	616	630,000
1958 .....	1,202,100	994,900	623	592	620,000
1959 .....	1,227,500	1,116,250	739	612	825,000
Average ....	1,167,380	931,470	612		586,600
1960 .....	1,129,100	957,100	587	622	562,000
1961 .....	1,306,900	1,171,700	698	647	818,000
1962 .....	1,502,600	1,315,300	638	657	838,600
1963 .....	1,408,800	1,216,700	634	659	771,000
1964 .....	1,171,800	1,084,300	752	662	815,000
Average ....	1,303,840	1,149,020	662		760,920
1965 .....	1,294,000	1,004,400	568	658	570,000
1966 .....	923,900	800,700	721	663	577,000
1967 .....	711,300	616,300	625	660	385,000
1968 .....	878,600	809,500	630	659	510,000
1969 .....	952,000	790,800	809	671	640,000
Average ....	951,960	804,340	671		536,400
1970 .....	973,300	883,300	816	854	680,000

in view of the lack of suitable processing facilities. There is also the question of whether farm income from expanded soybean production will be sufficient to bring large acreage gains. The key factor will be returns relative to other summer crops like corn and sunflowerseed.

### Crops Competing for Oilseed Acreage

The major oilseeds—sunflowerseed, flaxseed and peanuts—are grown almost totally in the Pampa, and are produced by using mechanized planting and harvesting techniques. The same characteristics are true of the principal grains—corn, wheat, and grain sorghum—grown in Argentina. Similar production techniques contribute to competition between grains and oilseeds for acreages, since there appears to be considerable reticence among large landholders to convert pastureland to cropland.

Expanded grain acreage in the past 5 years has resulted in reduced oilseed and forage acreage. Cattle production remains a thriving enterprise on the Pampa, though cattle, too, are extensively raised, using only pasture and forage crops as feed components. With increases in the last 5 years in cattle numbers on the Pampa and decreases in forage crops, there has been an increase in annually seeded pasture. Forage and pasture for livestock production compete directly with grain and oilseed production, delineating the three major components that compete for land on the Pampa.

The high percentage of agricultural land in the Pampa, divided into relatively large farms, influences the competition for land among alternative crops. Competition actually exists on two levels.

The first level is determined by the decision of large landholders whether to reduce pasture and forages and increase crop acreage. If there seems to be an increased profitability of producing grains and oilseeds versus livestock, the decision made will reduce grazing activities in favor of cropping activity. This is easily accomplished as the landowner will rent or contract out more acreage to small tenants or contractors who apply their labor to the more intensive (and profitable) cultivation of crops. Thus, on the first level, livestock prices—principally beef—versus grain and oilseed prices, determine the changes in acreage devoted to each. There are generally no radical shifts as changes take place only at the margin.

On the second level, the profitability of different grain and oilseed crops determines the area planted to these crops. This is determined more by the small landowners, contractors, and tenants, who are more oriented to crop production, as opposed to the large landowners, who are oriented to livestock production.

There is no competition between grains and oilseeds as commodity groups, but rather between the individual grain and oilseed crops. This competition, while influenced by the relative profitability of crops, is also influenced by production practices and the different areas of production concentration. Thus, wheat and flaxseed compete for acreage in southern Buenos Aires Province, as little corn or sunflowerseed are grown there due to the short growing season. Corn, grain sorghum, and sunflowerseed, are more likely competitors for land, as their production is concentrated in the central part of the Pampa. However, wheat and flaxseed are also grown in these areas. In addition, planting and harvesting times influence competition between crops. Wheat and flaxseed are winter crops and are planted between May and August, whereas corn, grain sorghum, and sunflowerseed are planted between September and December. This also allows a second crop of sunflowerseed to be planted after the wheat harvest in October. Thus, there is competition between crops in each planting period and between acreage devoted to winter plantings and spring plantings. Also, depending on moisture conditions and the earliness of the wheat harvest, there is considerable double-cropping as a second crop of sunflowerseed is planted on wheat land following harvest.

Wheat is grown prior to sunflowerseed to reduce the risky nature of sunflowerseed. Economics have eliminated wheat in the central Pampa owing to the higher yields and better returns for alternative crops, but the need to hedge against sunflowerseed and certain rotation patterns keeps wheat in this region. (Actually, oilseeds in general tend to be more of a residual crop, as they are planted only after the grains have been planted. Nevertheless, profitability of oilseeds versus grains influences the amount of acreage devoted to each.)

With the increase in double-cropping of sunflowerseed following wheat, an additional factor has influenced the amount of acreage devoted to sunflowerseed. This is the profitability of growing wheat plus second-crop sunflowerseed, versus the returns received from growing a competing grain or oilseed. In recent years, this practice seems to have been most profitable even though it appears to lower sunflowerseed yields.

The acreage planted to peanuts is more a function of weather conditions at planting than of competition between crops. Peanuts are grown in a rather concentrated area in Cordoba Province where farmers specialize in their production. Moisture conditions of the soil at the time of planting are the determining factor of total acreage planted to peanuts.

## PRODUCTION PRACTICES

Oilseed producers in Argentina have used many of the production practices common in the United States. These practices include seed adapted to the given area and mechanized planting and harvesting operations, but grains and oilseeds are not irrigated and fertilizer is applied only on wheat where double-cropped with potatoes.

However, yields in Argentina have not demonstrated the increases of other countries. Low yields have been cited as a result of inadequate fertilization, adverse weather, or both. Perhaps of more importance is the low income to producers; the vast availability of land, resulting in extensive farming practices; and, finally, the lack of a premium that would be associated with yields if acreage were restricted for one reason or another and land prices were rising. Also, the economic climate has not fostered investment, and changing policies result in certain risks not common in other producing countries.

The governmental agricultural research organization has concentrated its activities on improving yields through improved seed varieties. It is experimenting with several types but results to date have not demonstrated a good yield response. Researchers indicate that results have not been encouraging because the period of daylight is shorter in Argentina than in other producing countries. They keep in close touch with developments in other countries that are

able to test new seed varieties or other advances rapidly. As is true in all research efforts, more could be accomplished if funds were available.

### Planting and Harvesting Periods

The planting and harvesting periods for oilseed crops and grains imply that competition for land is between flaxseed versus wheat and sunflowerseed and peanuts versus corn and sorghum.

The planting and harvesting seasons for these products are as follows:

It has been stated that if farmers have trouble getting wheat planted, they will put in flaxseed. The same is true for corn, sorghum or sunflowerseed if weather limits corn planting. Weather is also a factor in acreage planted to oilseeds, particularly peanuts. Of much more importance, however, is the competition from grains and livestock.

### Extension Services

The Instituto de Tecnologia Agropecuaria (INTA) and Instituto Agroindustrial de Oleaginosos (IADO) have cooperated in preparing pamphlets on recommendations for oilseed production that are distributed to farmers. These pamphlets inform the farmer on planting methods, seed varieties, rate of seeding, insects, insecticides, and expected yields for the given areas. Pamphlets are available for sunflowerseed, flax-

	<i>Planting season</i>	<i>Harvesting season</i>
Flaxseed . . . . .	May — September	November — January
Peanuts . . . . .	September — November	March — May
Sunflowerseed . . . . .	September — January	March — June
Soybeans . . . . .	August — December	April — June
Grains:		
Corn . . . . .	August — December	March — June
Sorghum . . . . .	September — December	March — June
Wheat . . . . .	May — August	November — January

seed, peanuts, and soybeans. INTA also prepares more detailed publications for farmer use independent of IADO.

Argentina has imported various varieties of sunflowers for seed purposes. At least 14 varieties have been imported from the USSR, including Smyrna. The oil content of these imported varieties has been relatively low; i.e., 40 percent to 44 percent. Resistance to diseases has also been reported as poor. INTA reportedly has had the best experience with a locally developed variety called guayacan.

### Degree of Mechanization

Farm mechanization is fairly well advanced in Argentina. Within the past decade and a half, agricultural labor has become relatively scarce because of

rural migration to urban areas. This has provided incentives for a more rapid adoption of agricultural machinery, particularly tractors.

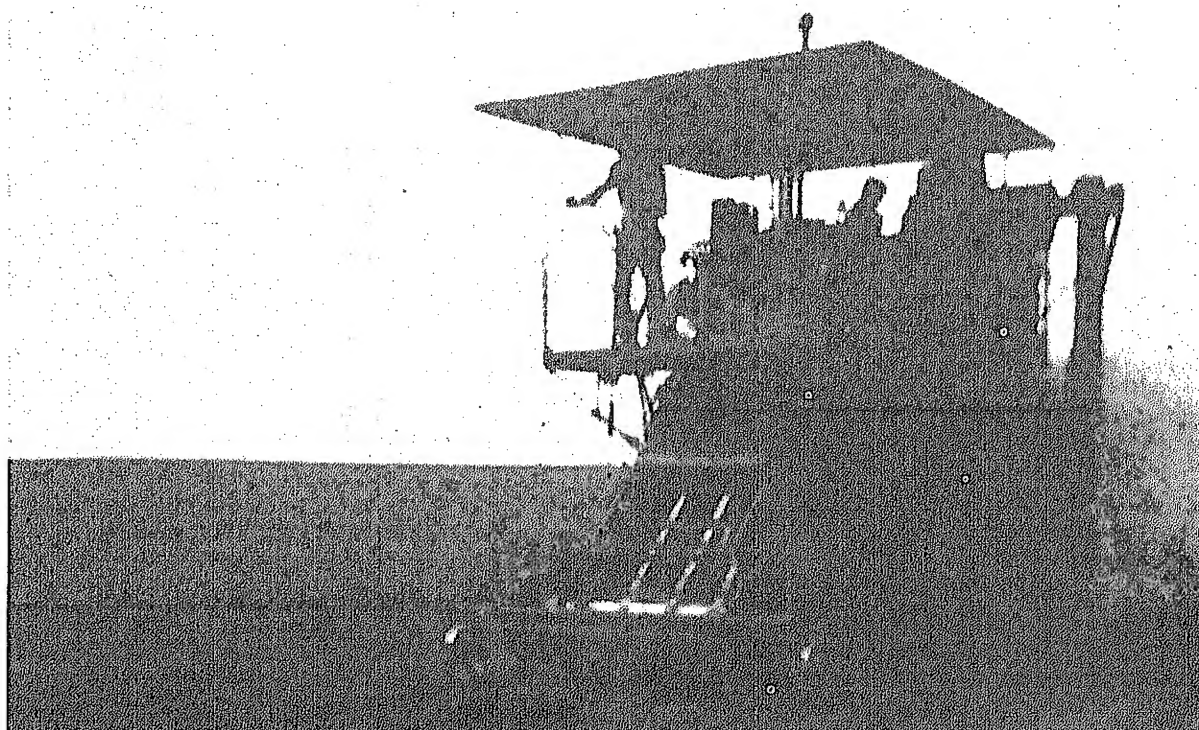
In 1968, the latest year for which data are available, the number of tractors had increased to 126,000—up 82,000 from the 1955 level. This level of over 120,000 has remained quite constant since 1965 (Table 12). However, it has been estimated that large numbers of older, imported tractors (Soviet 15 and 30 HP) are being taken out of service because of age and lack of replacement parts.

Prior to World War II, almost all of Argentina's agricultural machinery was imported. By the end of the war, a heavy demand existed that could not be met by foreign suppliers. This latent demand provided the necessary market for the development of a domestic industry. As the infant machinery industry developed, it became necessary for the Government to provide some protection from imports. In a matter of only a few years, however, imports began to increase so rapidly that the Government imposed high duties to protect the local industry. This resulted in Argentine-produced tractors costing about twice as much as those available to farmers in other countries.

Most of the wheat farms have tractors and equipment for planting and harvesting operations. This same equipment can be adjusted to harvest oilseeds, and proper modification, the planting equipment can also be used. This is particularly beneficial to those farmers that follow wheat with sunflowerseed. Specialized equipment, however, is required for planting and harvesting of peanuts. Tung nut harvesting is by hand.

There is very little contract planting of oilseed crops in Argentina. With respect to land rental, the law requires that a given percentage of the crop goes to the landowner. This requirement largely restricts land rental. However, farmers use contract harvesting to some extent because of the high cost of combines.

A specially adapted peanut harvester permits bagging of peanuts in the field. Argentina is the only country that has such equipment.



### Fertilizer and Pesticide Use

Fertilizer use recommendations have not been developed for oilseeds produced in Argentina by either government researchers or other research groups. Studies have been conducted on fertilizer use on other major export crops, indicating, for example, a good potential for additional fertilizer use in wheat production.

Information is not available on the production response of flaxseed to fertilizer application. However, Argentine yields, when compared to those in the United States and Canada, are quite favorable. This would seem to indicate that flaxseed producers do not need to use additional fertilizer. INTA trials in Argentina indicate that sunflowerseed production does not respond to additional fertilizer application. However, at least one country—the USSR—apparently feels fertilizer use is important since it envisions expanding fertilizer application to increase sunflower yields.

No information is available on fertilizer use on peanuts or soybeans. On the basis of peanut yields and studies in the United States, it would appear advantageous to fertilize peanuts in Argentina. At least trials could be conducted to determine its feasibility. Soybeans, on the other hand, have shown very little increase in yields in the United States.

Pesticides are readily available in the oilseed producing area and are extensively used in crop production. It has been estimated that some 80 to 90 percent of the sunflower and flaxseed producers use some type of pesticide. Similar data are not available for the peanut and soybean producers.

### Disease Control

Control of plant diseases continues to be a major problem in sunflowerseed production and creates major difficulties in harvesting. A variety of rust known as *puccinia helianthi* became a major problem in 1952 and appears quite common today. Black pest disease, called FORMA or Black Spot, is a fungus which starts in early stages in maturing stems. It is not uncommon for vast areas to be completely devastated by disease, particularly on or after the second planting.

A new type of leaf rust appeared in 1970 and was particularly widespread in Entre Rios and Cordoba. The flower head contained uredospores of an unidentified rust fungus, as well as *Alternaria*-type spores of the tenuis type and conidia of another fungus, *Sclerotinia*. The widespread wilting of the plant may have been the result of a root-rotting disease or nematodes.

## PRODUCTION COSTS AND FARMER RETURNS

Inflation, as reflected in the general wholesale price index, showed a phenomenal rise during the sixties, increasing over six times the level of 1960. This rapid rate of inflation is particularly hard on the farmers since they must make their investments 6 to 8 months prior to receiving any returns from their crops. Unlike factory workers who receive regular paychecks, the farmer must live on his savings through the growing season, while bearing any general price increases.

The increases in the wholesale price index also hurts the farmer to the extent that the prices he receives generally do not rise as fast as the prices he pays. Industries, on the other hand, have much greater price flexibility in maintaining the real value of their income. Farm returns have not kept pace with the rapid rate of increase in costs, particularly in the last 5 years.

The Government has raised the support prices for oilseeds but not enough to overcome the increase in the cost of living. The gross returns per hectare from oilseed production were not as high in 1969 as they were in 1960 after deflating the peso by the general wholesale price index (Table 12).

### Gross Returns for Oilseeds, Competing Crops

Sunflowerseed and corn are planted at about the same time and are produced in basically the same area of the country. During the decade of the sixties, there was little competition for land resources between these crops, since gross returns for corn production exceeded those of, sunflowerseed in every year. Corn acreage increased by 44 percent during this period, while sunflowerseed remained about the same. This disparity in planted acreage continued in spite of the Government's policy of raising the sunflowerseed support relative to corn in the latter part of the decade. However, as sunflower support prices have less influence on farmers' planting intention than world prices? Which influence net returns, little acreage diversion to corn has taken place.

However, during the last decade, sunflowerseed has managed to keep its acreage about the same despite the advantageous returns to corn producers. One reason for this is the planting of sunflowerseed as a second crop following wheat. Sunflowerseed yields

are greatly lower when planted as a second crop but the gross returns per hectare from wheat and second-crop sunflowerseed compare favorably with those of corn. Also, as previously stated, planting and harvesting equipment used for wheat is adaptable to sunflowerseed. This contributes to reduced production costs in the second-cropping operation.

Gross returns for wheat and flaxseed, which are planted at about the same time, favored wheat production in the early 1960's. In the mid-sixties, the Government began to favor flaxseed in its support policy by increasing flax supports relative to those for wheat, and 1968 and 1969, gross returns for flaxseed exceeded those for wheat. Competition of flaxseed for wheat acreage remains limited, however. During the sixties, flaxseed was produced on only 5 to 15 percent of the combined acreage.

Gross returns for peanuts are very favorable relative to flaxseed and sunflowerseed. Peanuts, however, are not fully competitive with other crops. Initial specialized equipment costs are high, forcing farmers who produce this crop to specialize only in peanut production. Not all farmers are capable of capitalizing such an investment.

### Production Costs for Oilseeds, Other Crops

Production cost data on a hectare basis were obtained for sunflowerseed, flaxseed, wheat, and corn. The data covers the 5-year average cost from 1965 through 1970 and the 1969-1970 growing season. A comparison of the production costs between competing crops during the last 5 years shows production costs for corn to be much higher than sunflowerseed, and wheat to be slightly more expensive than flaxseed (Table 13). In the 1969-70 growing season, corn became even more expensive in relation to sunflowerseed, and wheat was a little less expensive than flaxseed (Table 14).

Fixed costs for the four crops averaged about 15 percent of the total costs of production. Equipment expenditures accounted for about half of these costs, while taxes and building and land expenses each amounted to one-fourth.

Harvesting and storage costs are a large part of expenses. Many seeds are bagged at harvest time in the

TABLE 12--GROSS RETURNS FOR ARGENTINE OIL-SEED CROP AND MAJOR COMPETING CROPS

Item	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68	1968-69	1969-70
<b>Wheat:</b>										
Average price . . . Pesos/kg . . . .	8355	7839	9099	8926	6380	5980	7795	7359	7453	7418
Yield . . . . . Kg/hectare . . . .	1160	1295	1522	1575	1835	1281	1198	1260	983	1352
Gross income . . Pesos/hectare . .	969.18	1015.15	1384.87	1405.85	1170.73	766.04	933.84	927.23	732.63	1002.91
<b>Corn:</b>										
Average price . . . Pesos/kg . . . .	7529	7589	9222	7066	7379	6793	7267	6454	7171	7057
Yield . . . . . Kg/hectare . . . .	1767	1894	1648	1801	1678	2150	2466	1942	1929	2330
Gross income . . Pesos/hectare . .	1330.37	1437.35	1519.79	1272.59	1238.20	1460.50	1792.04	1253.37	1383.29	1644.28
<b>Grain sorghum:</b>										
Average price . . . Pesos/kg . . . .	4946	5983	6600	4637	5556	4785	6220	5509	5496	(1)
Yield . . . . . Kg/hectare . . . .	2265	2159	1660	1751	1458	2524	1805	1752	1908	2040
Gross income . . Pesos/hectare . .	1120.27	1291.73	1095.60	811.94	810.06	1207.73	1122.71	965.18	1048.64	(1)
<b>Sunflower:</b>										
Average price . . . Pesos/kg . . . .	16674	12212	14402	14930	12941	10208	10403	9951	10639	12633
Yield . . . . . Kg/hectare . . . .	651	718	611	628	746	765	902	891	737	846
Gross income . . Pesos/hectare . .	1085.48	876.82	879.96	937.60	965.40	780.91	938.35	886.63	784.09	1068.75
<b>Peanuts, shelled basis:</b>										
Average price . . . Pesos/kg . . . .	24142	18030	21926	19236	18829	16154	16580	15933	20319	19491
Yield . . . . . Kg/hectare . . . .	983	1083	820	676	812	862	756	689	623	1083
Gross income . . Pesos/hectare . .	2373.16	1952.65	1797.93	1300.35	1528.91	1392.47	1253.45	1099.16	1265.87	1518.35
<b>Flaxseed:</b>										
Average price . . . Pesos/kg . . . .	15017	14957	16173	13621	11012	10073	12794	12743	14038	13348
Yield . . . . . Kg/hectare . . . .	587	698	638	634	752	568	721	625	630	809
Gross income . . Pesos/hectare . .	881.50	1044.00	1031.84	863.57	828.10	572.15	918.77	796.44	884.39	1079.85

<sup>1</sup> Not available.NOTE: Prices deflated by general wholesale price index.  
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TABLE 13.--PRODUCTION COSTS FOR ARGENTINE FLAXSEED, SUNFLOWERSEED, CORN AND WHEAT, AVERAGE 1965-70

Item	Flaxseed		Sunflower		Corn		Wheat	
	Average cost	Share of total costs	Average cost	Share of total costs	Average cost	Share of total costs	Average cost	Share of total costs
	Pesos per hectare	Percent	Pesos per hectare	Percent	Pesos per hectare	Percent	Pesos per hectare	Percent
Land rent: tenant and partnership -----	28.01	14.61	43.88	18.86	45.34	38.17	16.62	17.92
Cost of production:								
Special cost of cultivation:								
Seed and disinfection:-----	24.69	12.88	3.99	1.71	16.74	6.14	16.35	7.68
Harvesting and bagging-----	25.16	13.12	34.61	14.87	41.31	15.14	26.24	12.32
Drying and storage-----	8.61	4.49	12.99	5.58	—	—	—	—
Application of insecticides.-----	3.77	1.97	5.21	2.24	2.76	1.01	1.00	.47
General costs:								
Conservation of property improvements soil	3.98	2.08	4.27	1.83	4.52	1.66	3.96	1.86
Repairs and stocks of machinery tools,	13.17	6.87	14.45	6.21	14.83	5.44	13.80	6.48
wagons, and various utensils.-----								
Fuel and lubricants.-----	7.09	3.70	7.66	3.29	8.93	3.27	6.99	3.28
Taxes and municipal fees-----	4.61	2.40	6.03	2.59	6.19	2.27	6.65	3.12
Insurance.-----	4.61	2.40	4.72	2.03	4.92	1.80	5.39	2.53
Salaries:								
Salaries and day wages.-----	4.61	2.40	8.17	3.51	8.98	3.29	4.91	2.31
Compensation to the farmer and his family.	30.57	15.94	38.32	16.47	42.23	15.48	32.82	15.41
Deducted for expenses.-----	10.00	5.21	10.00	4.30	10.00	3.67	10.66	5.01
Interests:								
Property improvements (soil and building).	4.86	2.53	5.01	2.15	5.29	1.98	4.80	2.25
Machinery, tractors, tools, wagon, and	7.48	3.90	7.86	3.38	8.08	2.96	7.50	3.52
various utensils.-----	6.05	3.15	6.52	2.80	7.07	2.59	5.37	2.52
Circulating agricultural capital -----								
Amortization:								
Property improvements (buildings)----	1.02	.53	1.07	.46	1.15	.42	1.01	.47
Machinery, tractors, tools, wagons, and	12.06	6.29	12.95	5.56	13.31	4.88	11.94	5.61
various utensils.-----								
Transportation:								
Movement from field to loading point --	1.92	1.00	3.09	1.16	3.07	1.12	3.07	1.12
Movement of freight, unloading,	3.69	1.61	4.35	1.69	4.35	1.69	4.35	1.69
storage, and loss.-----								
Rail freight (dol. per cwt.)-----	5.94	3.10	6.46	2.80	6.46	2.80	6.46	2.80
Commission and administrative expenses --	—	—	—	—	—	—	—	—



TABLE 14--PRODUCTION COSTS OF ARGENTINE FLAXSEED, SUNFLOWERSEED, CORN, AND WHEAT, 1969-70

Item	Flaxseed		Sunflower		Corn		Wheat	
	Average cost	Share of total cost	Average cost	Share of total cost	Average cost	Share of total cost	Average cost	Share of total cost
Land rent, tenant and partnership -----	28.92	14.10	42.86	18.45	45.02	15.31	34.37	16.68
Cost of production :								
Special costs of cultivation :								
Seed and disinfection -----	25.04	12.20	3.61	1.55	15.69	5.33	15.26	7.41
Harvesting and bagging -----	28.59	13.94	35.67	15.35	52.93	17.99	26.92	13.07
Drying and storage -----	11.73	5.72	16.88	7.27	-	-	-	-
Application of insecticide -----	3.87	1.89	4.70	2.04	2.55	.87	.90	.44
General costs:								
Conservation of property improvements (soil) -----	4.04	1.97	4.05	1.74	4.27	1.45	3.77	1.83
Repairs and stocks of machinery, tools, wagons, and various utensils -----	12.57	6.13	13.07	5.63	14.12	4.80	12.93	6.28
Fuel and lubricants -----	6.85	3.34	6.93	2.98	8.43	2.87	6.80	3.30
Taxes and municipal fees -----	6.75	3.29	5.37	2.31	6.67	2.27	6.95	3.37
Insurance -----	5.26	2.56	4.22	1.82	4.57	1.55	5.80	2.82
Salaries:								
Salaries and day wages -----	4.67	2.28	7.25	3.12	8.41	2.86	4.62	2.24
Compensation to the farmer and his family -----	30.86	15.04	34.01	14.64	39.56	13.45	30.86	14.98
Deducted for other purposes -----	- 10.00	- 4.87	- 10.00	- 4.30	- 10.00	- 3.40	- 10.43	5.06
Interests :								
Property improvements (soil and building) -----	4.97	2.42	4.48	1.93	5.09	1.73	4.59	2.23
Machinery, tractors, tools, wagon and various utensils -----	7.29	3.55	7.11	3.06	7.70	2.62	7.00	3.40
Circulating agricultural capital -----	6.52	3.18	6.29	2.71	7.36	2.50	5.22	2.53
Amortization:								
Property improvement (buildings) -----	1.05	.51	.96	.41	1.08	.36	.97	0.47
Machinery, tractors, tools, wagons, and various utensils -----	11.62	5.66	11.71	5.04	12.66	4.30	11.25	5.46
Transportation:								
Movement from field to loading point -----	2.61	1.27	3.52	1.52	8.21	2.79	4.69	2.32
Movement of freight, unloading, storage and loss -----	4.05	1.97	6.40	2.75	12.04	4.09	5.43	2.66
Rail freight (dol. per cwt.) -----	7.44	3.60	12.59	5.42	26.76	9.10	15.16	7.35
Commission and administrative expense -----	-	-	8.51	3.66	21.02	7.15	12.44	6.06
Sales tax -----	.34	.17	2.09	.90	-	-	.50	.2
Total -----	205.15	99.92	232.33	100.00	294.14	99.99	206.00	100.00

Secretary of Agriculture and Livestock, National Administration of Economy and Rural Sociology

field. Although the movement is toward bulk handling, bagging is still done for internal use. Export grains are generally handled in bulk from the farm forward. Harvesting and storage costs have amounted to 30 percent of the sunflowerseed costs of production, 21 percent for corn, 17 percent for wheat, and 23 percent for flaxseed. In the 1969-70 growing year, harvesting and storage costs accounted for a slightly greater percentage of total costs.

Interest costs made up a smaller part of the producer's cost in the 1969-70 growing year than during the previous 5 years, averaging about 12 percent. Owing to a high rate of inflation, the cost of money, or interest, is high to the farmer. High interest rates prevent the proper capitalization of equipment and materials. This, in turn, fosters continued use of older, more expensive production methods.

Transportation costs amount to one fourth of the cost of producing corn and wheat. These costs include movement of the grain from the field, railroad freight, loading and unloading, commissions, administrative expenses, and loss of weight. Sunflowerseed transportation costs amount to 15 percent of the total and flaxseed 8 percent. To a large degree, these costs reflect the relative yields, with corn having the highest and flaxseed the lowest. The 1969-70 season had higher transportation costs, probably because of increased production.

Other production costs include insurance, labor, repairs, fuel, and lubricant, at 14 percent of the total. Seed and pesticide costs are highest for flaxseed, comprising 20 percent of the cultivating bill, compared with 11 percent for wheat, 10 percent for corn and 6 percent for sunflowerseed.

Total production costs per hectare for the 5-year period were 195 pesos (\$49) for corn, 161 pesos (\$40) for sunflowerseed, 153 pesos (\$38) for wheat, and 143 pesos (\$36) for flaxseed. During 1969-70, these costs were higher for all crops, although they maintained their same relative position.

Data were not available to determine costs of production for the other oilseeds; i.e., peanuts and soybeans.

### Gross Returns by Province

The oilseeds produced in Argentina that are significant enough to make comparisons of gross returns on a Province basis are flaxseed, sunflowerseed, peanuts, and soybeans. Gross returns are calculated on the basis of the average yields times average annual prices (received in Buenos Aires), deflated to a base year of 1956. This approach permits a more factual comparison of returns for the 10-year period, 1960-69.

The 10-year average gross returns for oilseeds for Buenos Aires indicate that soybeans yield the highest returns, followed by flaxseed and finally sunflower-

seed. However, the acreage in soybeans is small, and may not be representative. Actually, sunflowerseed appears to be the best option for producers since it is generally planted following wheat, and gross returns are substantially greater per hectare from the combination of wheat and sunflowerseed than from other crops.

In Cordoba, the gross returns for peanut production far outstrip those for soybeans, sunflowerseed, or flaxseed. Even though some Argentine authorities say the costs of planting and harvesting peanuts is greater than those for other oilseeds, peanuts appear to be the most profitable crop in this Province. Peanut production has historically been concentrated here.

In Santa Fe, gross returns from peanut production far exceed those for the other oilseeds. This would seem to indicate a movement toward greater peanut production in Santa Fe at the expense of the other oilseeds. However, acreage remains very small, possibly indicating lack of incentive to invest in the specialized equipment needed.

In Chaco, Formosa, Misiones, San Luis, and Tucuman, it is difficult to say which oilseed is the most profitable to produce. When transportation costs from these interior Provinces to Buenos Aires (the base pricing point for oilseeds) is subtracted, it appears advantageous for oilseed producers to explore alternative crops that have a cash market closer to the point of production; i.e., beef, fruits, and vegetables.

### Net Returns for Oilseeds, Competing Crops

Returns to the farmer were substantially higher during the 1969-70 growing season owing to increased yields and better prices than the average for the last 5 years. On a competing-crop basis, corn produced much higher net returns than did sunflowerseed, while flaxseed netted slightly more than wheat. (Net returns are calculated by subtracting production costs from the product of an average yield and an average price. They include the return to the farmer and his family for their investments, management and labor).

Production cost data were available only for corn, wheat, flaxseed, and sunflowerseed.

During the 1965-1970 period, corn had a net return of 96 pesos (\$24)<sup>1</sup> per hectare, which was 33 percent of the gross return. When compared to production costs, this amounts to a return of \$49 for every \$100 invested.

In the 1969-70 season, corn returned 164 pesos (\$41), or 43 percent of gross and 75 percent on investment costs. Sunflowerseed, with one-third the product weight of corn production per hectare, returned 14 pesos (\$3.40, or 8 percent of gross and a

<sup>1</sup>Exchange rate, 1970: 4 pesos equalled 1 U.S. dollar.

TABLE 15-- ARGENTINE PRODUCTION COSTS AND NET RETURNS: SUMMARY FOR SUNFLOWERSEED, FLAXSEED, CORN, AND WHEAT, 1965-1970

Items	Sunflowerseed			Flaxseed			Corn			Wheat		
	Cost	or return	Share of total	Cost	or return	Share of total	Cost	or return	Share of total	Cost	or return	Share of total
	Pesos	Dol.	Percent	Pesos	Dol.	Percent	Pesos	Dol.	Percent	Pesos	Dol.	Percent
<b>Fixed costs:</b>												
Buildings and soil	5.34	1.34	3.3	5.00	1.25	3.5	5.67	1.42	2.9	4.97	1.24	3.3
Equipment	12.95	3.24	8.1	12.06	3.01	8.4	13.31	3.33	6.8	11.94	2.99	7.8
Taxes	6.03	1.51	3.8	4.61	1.15	3.2	6.19	1.55	3.2	6.65	1.66	4.4
Total	24.32	6.08	15.2	21.67	5.42	15.1	25.17	6.29	12.9	23.56	5.89	15.4
<b>Variable costs:</b>												
Interest	19.39	4.85	12.1	18.39	4.60	12.8	20.54	5.14	10.5	17.67	4.42	11.6
Seeds and pesticides	9.20	2.30	5.7	28.46	7.12	19.9	19.50	4.88	10.0	17.35	4.34	11.3
Harvesting and storage	47.60	11.90	29.7	33.77	8.44	23.6	41.31	10.33	21.1	26.24	6.56	17.2
Repairs, fuel, and lubricants	22.11	5.53	13.8	20.26	5.07	14.1	23.76	5.94	12.2	20.79	5.20	13.6
Labor and day wages	8.17	2.04	5.1	4.61	1.15	3.2	8.98	2.25	4.6	4.91	1.23	3.2
Insurance	4.72	1.18	2.9	4.61	1.15	3.2	4.92	1.23	2.5	5.39	1.35	3.5
Transportation	25.01	6.25	15.6	11.41	2.85	8.0	51.04	12.76	26.1	36.73	9.18	24.1
Total	136.20	34.05	84.8	121.51	30.88	84.9	170.05	42.51	87.1	129.08	32.27	84.6
Total costs	160.52	40.13	100	143.18	35.80	100	195.22	48.81	100	152.64	38.16	100
<b>Returns:</b>												
Yield <sup>1</sup>	828	-	-	671	-	-	2163	-	-	1223	-	-
Price <sup>1</sup>	2102	Dol./kg. .0525	-	2402	Dol./kg. .06005	-	1345	Dol./kg. .03363	-	1364	Dol./kg. .0341	-
Gross returns	174.05	Dol. 43.51	-	161.07	Dol. 40.27	-	290.92	Dol. 72.73	-	166.82	Dol. 41.71	-
Net returns	13.53	3.38	-	17.89	4.47	-	95.70	23.93	-	14.18	3.55	-
Net returns as share of gross	Percent 7.8	-	-	Percent 11.1	-	-	Percent 32.9	-	-	Percent 8.5	-	-
Net returns as share of cost	8.4	-	-	12.5	-	-	49.0	-	-	9.3	-	-

<sup>1</sup> Estimate of Bolsa de Cereales, Numero Estadístico, 1970.  
NOTE: 1970 Pesos 4.00 = 1 U.S. DOLLAR.  
Table on production costs of Argentina, 1965-70.

slightly higher return on costs during the 5-year period. The 1969-70 season returned 84 pesos (\$21), or 34 percent of gross and 51 percent of investment costs. (Table 15)

Corn, therefore, is able to return more to the farmer despite higher costs of production. Corn averaged 121 percent of the cost of sunflowerseed production per hectare during the 5-year period.

Of the other two competitors, flaxseed returned more than wheat. Over the 5-year average, flaxseed returned about \$4.50 per hectare, while wheat returned \$3.50. Wheat closed some of the gap in the

1969-70 year, with a return of \$18.75 per hectare, while flaxseed returned \$22.25. On cost of investment, wheat returned 50 percent, while flaxseed returned 57 percent.

The substantially higher net returns in the 1969-70 season reflect higher world prices for wheat, and higher support prices for flaxseed, rapid inflation, and above average yields. Export taxes provide a buffer between local and export returns. As mentioned before, though, wheat can be double-cropped with sunflowerseed, yielding additional income to the farmer.

## PRODUCTION INCENTIVES AND CONTROLS

The Argentine Government influences acreage planted to oilseeds through its tax policies and price support programs. (Incentives for the producer to plant oilseeds are vested in the Government's price support policies governing grains and oilseeds.) Price support programs play a somewhat limited role, however, as support prices are often announced after planting. The price support program is administered by the National Grain Board, which generally buys grains and oilseeds offered to it at support prices.

The support program differs from that in the United States. The Board's ability to support a commodity is limited by the amount of funds budgeted to carry out its operations. When its funds are exhausted, the Board delays payments which may result in farmers selling for quick cash in the open market. Also, the availability of funds is not known in advance. The Board is not required to make payment for the commodity when it is due, even though the Government has taken ownership of the crop. This places a great deal of uncertainty on the farmer. Therefore, the support price provides somewhat of a floor on prices, but by no means an effective one.

The Argentine Government maintains a policy of expanding production under the private enterprise system with a minimum of controls. Most support prices, therefore, are fixed generally below the free-market level. Only commodities that generally have excess supplies in relation to demand are bought by the Grain Board because prices have fallen below support. In recent years, this has included substantial quantities of flaxseed and linseed oil (which also is under a support price) for which there has been a decreasing export market.

Despite its opposition to direct production controls, the Government nevertheless aids in developing auxiliary supporting institutions, such as agricultural credit, research, and extension. The Government also administers various types of taxes, including income taxes, land taxes, gross sales tax, and export taxes.

The export retention taxes produce the heaviest burden on the producer. The tax is designed to maintain a significant margin between the internal price and the export price. This not only provides a major source of government revenue, but also provides for a decreased cost of living, particularly in the

urban areas. However, the tax deprives producers of world price levels and acts as a barrier to the producers' full participation in the world market. Also, internal prices of competing grains and oilseeds can be regulated somewhat by applying different export tax rates. The retention taxes generally rise when the peso is devalued, in order to transfer increased peso returns from export to the government, and then fall with rising internal prices.

### Support Prices and Minimum Prices

Up to the 1930's, government intervention in domestic marketing of grains and oilseeds was non-existent, but with the depression of world markets at that time serious surpluses began to accumulate. In 1933, official purchase prices for wheat, corn, and linseed were instituted.

The Grain Regulatory Board was established to buy these grains offered at the minimum prices, sell the grain for export, and absorb the loss. During World War II, as the export market became even more restricted, the Grain Regulating Board extended its authority to buy most other grains at minimum prices. It bought all corn, linseed, and wheat produced, eventually taking over all domestic marketing operations in grains.

This policy was continued during the Peron Administration in the postwar period, as the government continued to buy grains at low prices and sell them at much higher prices on the world market, sometimes maintaining a margin of 100 percent between domestic and world prices. This condition was rectified beginning in 1955, and by 1960 compulsory state marketing of grains was abandoned.

As marketing of grains was taken over by private commercial channels, support prices remained in effect, but served primarily as insurance prices to producers and as an aid in marketing surplus products that could not be accommodated in the commercial marketplace.

The National Grain Board is authorized to buy all the grains or oilseeds offered to it at the support price. Up until the 1966 crop year, the support price also served as a minimum trading price, below which private sales were not legally allowed.

TABLE 16--ARGENTINE OILSEED PRODUCTION AND GOVERNMENT PURCHASES

Crop year	Sunflowerseed			Flaxseed			Peanuts		
	Production 1,000 metric tons	Purchases		Production 1,000 metric tons	Purchases		Production 1,000 metric tons	Purchases	
		Quantity 1,000 metric tons	Share of total Percent		Quantity 1,000 metric tons	Share of total Percent		Quantity 1,000 metric tons	Share of total Percent
1945-46	890	493	55.4	964	550	57.1	157	73	46.5
1946-47	688	603	87.7	1,034	866	83.8	113	44	38.9
1947-48	930	776	83.5	901	766	85.0	105	78	74.3
1948-49	1,088	1,040	95.6	433	374	86.4	85	51	60.2
1949-50	712	-	-	676	215	31.8	-	-	-
1950-51	1,021	-	-	559	48	8.6	93	14	15.1
1951-52	692	615	88.9	313	-	-	155	105	67.7
1952-53	428	314	73.4	584	557	95.4	204	131	64.2
1953-54	345	230	66.7	410	362	88.3	170	119	70.0
1954-55	283	230	81.3	405	351	86.7	118	56	47.4
1955-56	754	18	2.4	238	172	72.3	216	-	-
1956-57	625	-	-	620	-	-	318	-	-
1957-58	759	-	-	730	-	-	290	-	-
1958-59	387	-	-	620	-	-	241	-	-
1959-60	802	-	-	825	-	-	209	-	-
1960-61	585	-	-	562	-	-	266	-	-
1961-62	860	-	-	818	-	-	433	-	-
1962-63	462	-	-	839	-	-	312	-	-
1963-64	460	-	-	771	66	8.6	333	-	-
1964-65	757	-	-	815	2	0.2	439	-	-
1965-66	782	-	-	570	-	-	411	-	-
1966-67	1,120	127	11.3	577	13	2.2	354	-	-
1967-68	940	15	1.6	385	-	-	283	-	-
1968-69	876	-	-	510	7	1.4	217	-	-
1969-70	1,140	1/	-	640	129	20.2	235	-	-
1970-71	830	-	-	680	187	27.5	388	-	-

<sup>1</sup> Negligible.

From 1966-67 through 1969-70, separate minimum trading prices for oilseeds were also instituted. These were designed to control prices received by farmers who sold their crops below the support price for cash instead of waiting for payment at the support level, part of which was deferred. Ready cash was particularly desirable because of the high rates of inflation that reduced the value received for crops when the farmer received credit for his produce.

Prior to 1966-67, the National Grain Board offered 70 percent of the support price on delivery and the balance within 90 days with interest. The Grain Board, between 1966-67 and 1969-70, reduced the spread between the minimum price and the support price, compensating for this by increasing the percentage of the direct payment.

Then, in the 1970-71 crop year, the Board dropped the dual-price system, returning to the single minimum support price. The direct payment was increased to 90 percent, payable within 10 working days and the balance in 90 days. This also excluded discounts from the support price for commission-men's and brokers' fees, for which they had previously been paid out of the support price.

Support prices are paid on the basis of bagged products delivered at Buenos Aires with discounts for delivery to other Board installations, mostly ports. Support prices are announced annually and are generally increased to compensate for increased production costs and the generally high rate of inflation.

### Market Prices

Prices are generally considered as the main incentive for changes in production levels and shifts between alternative crops. Prices for oilseeds are derived from demand for the oil and meal byproducts. Prices for oilseed products, moreover, are determined mainly by export demand. Almost all the oilseed meals and the linseed oil are exported, whereas only about a quarter of the edible oils are exported.

Prices for meals are determined primarily by the world market price less the export tax. Internal prices for linseed oil in recent years, however, have been buoyed by the support price, as world prices have remained below support, plus the additional export tax. The National Grain Board has acquired large stocks of linseed oil, which it has been exporting at world prices. In some cases this has resulted in a loss, but in others gains have resulted from changes in world prices and exchange rates. (The Grain Board, also, must pay the export tax).

Prices for edible oils, on the other hand, reflect the interplay of domestic and foreign demand with variable supplies. In the last decade, edible oil exports have ranged from 5 percent of total production to nearly 40 percent, with domestic demand determining how much is exported.

Support prices for sunflowerseed have had little effect on the marketing of this oilseed in the last decade. In 1 of the last 10 years a surplus supply forced the sunflowerseed market prices below the support price for any extended period of time. During the bumper crop of 1966-67, the National Grain Board purchased a little over 11 percent of the crop (Table 16). In other years since 1955, sunflowerseed purchases by the Grain Board have been minor, as prices have stayed above the support level. From 1959-60 through 1963-64, harvest prices varied from 3 to over 100 percent above support in response to variable supplies, while in the remaining years consistently increasing supplies kept harvest prices close to support.

Only in the last couple of crop years has the National Grain Board had to purchase large quantities of linseed and linseed oil. During the last decade the only other large purchase was in 1963-64, when 8.5 percent of the crop was bought at support. Over this period, harvest prices averaged just above support. Since almost all the linseed, as oil, goes into the export market, the support prices have been compatible with world market prices. However, in 1969-70, world prices dropped below support, which had been maintained at the same level as in the previous year.

### National Grain Board

The agency that administers government policy related to grain and oilseed trade is the National Grain Board (Junta Nacional de Granos). Although it has been the policy of the government to allow trade in grains and oilseeds to remain with private traders in the commercial market, the Grain Board nevertheless performs various functions that influence this flow of trade, particularly as it relates to exports.

The Grain Board administers government-to-government sales of grains and oils. It plays a primary role in the negotiation of bilateral sales agreements with agencies of foreign governments but generally transfers the contracts to the private trade to execute delivery. Because of the prohibitive export levy on oilseeds, this involves only oil and meal. Linseed oil has been the only oilseed byproduct either included in bilateral agreements or sold directly for export by the Board. When difficulties arise in marketing of surplus stocks in Western Europe and LAFTA countries, the Board enters into contract with state-trading countries, such as the USSR, and sells directly. However, most Board sales, including wheat, are to Latin American countries.

The Board also has the power to influence domestic supplies and prices through its export policy. It has the authority to issue export licenses, adjust tax levels, and in periods of short domestic supplies, it has established export quotas.

The Grain Board administers most of the storage capacity in the country. The Board owns all of the

export elevators and about half of domestic storage space, for which it receives payments for storage costs. Commercial storage not owned by the Board must be licensed and storage rates approved. Finally, the Board has the power to impose special-purpose taxes on export sales and on oilseeds "industrialized" (sold to domestic crushers).

All of these functions complement the role of the

Board in buying oilseeds or oil offered to it at support prices. This role, however, involves primarily flaxseed in the case of oilseeds, and linseed oil in the case of oils. The Board has also purchased small quantities of other oilseeds, such as sunflowerseed, soybeans, and peanuts. Other oils purchased, in only two cases, since 1960, include sunflowerseed oil and soybean oil (Table 17).

TABLE 17--ARGENTINE NATIONAL GRAIN BOARD PURCHASES AND SALES  
[ In thousands of metric tons ]

ITEM	1963	1964	1965	1966	1967	1968	1969	1970	1971
<b>FLAXSEED</b>									
Supply:									
Beginning stocks	--	65,637	8,858	1,248	14,602	2,226	9,358	3,043	--
Purchases	65,637	2,230	--	12,554	167	7,345	128,747	187,310	--
Total	65,637	67,867	8,858	13,802	14,769	9,571	138,105	190,353	--
Distribution:									
Sales to industry <sup>2</sup>	--	59,009	7,610	200	12,543	213	7,345	90,940	--
Ending stocks	65,637	8,858	1,248	13,602	2,226	9,358	3,043	--	--
<b>PEANUTS</b>									
Supply:									
Beginning stocks	--	--	--	--	38	154	1	--	--
Purchases	--	--	--	38	153	--	--	--	--
Total	--	--	--	38	191	154	--	--	--
Distribution:									
Sales to industry <sup>3</sup>	--	--	--	--	37	153	--	--	--
Ending stocks	--	--	--	38	154	1	--	--	--
<b>SUNFLOWERSEED</b>									
Supply:									
Beginning stocks	--	--	--	--	125,615	48,160	1,212	--	--
Purchases <sup>1</sup>	--	--	--	126,731	14,534	241	--	--	--
Total	--	--	--	126,731	140,149	48,401	1,212	--	--
Distribution:									
Sales to industry <sup>3</sup>	--	--	--	1,116	91,989	47,189	241	--	--
Ending stocks	--	--	--	125,615	48,160	1,212	971	--	--
<b>SOYBEANS</b>									
Supply:									
Beginning stocks	--	--	--	--	667	1,603	2,600	983	--
Purchases	--	--	--	667	1,164	2,618	337	12	--
Total	--	--	--	667	2,314	4,221	2,600	--	--
Distribution:									
Sales to industry <sup>3</sup>	--	--	--	--	711	1,621	1,617	377	--
Ending stocks	--	--	--	667	1,603	2,600	983	--	--
<b>FLAXSEED OIL</b>									
Supply:									
Beginning stocks	--	--	--	--	--	--	--	--	--
Purchases	--	--	--	--	--	--	19,857	44,505	123,771
Total	--	--	--	--	--	--	19,857	44,505	123,771
Distribution:									
Sales to industry <sup>3</sup>	--	12,000	<sup>3</sup> 78,500	<sup>3</sup> 10,000	55,959	--	19,342	5,400	--
Ending stocks	--	--	--	--	--	--	--	--	--
<b>SOYBEAN OIL</b>									
Supply:									
Beginning stocks	--	--	--	--	--	--	--	--	--
Purchases <sup>1</sup>	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--
Distribution:									
Sales to industry <sup>3</sup>	--	--	17,850	--	--	--	--	--	--
Ending stocks	--	--	--	--	--	--	--	--	--

<sup>1</sup>Purchasing year runs from Dec. to Nov. All purchases attributed to earlier year.

<sup>2</sup>Sales are on a calendar year basis.

<sup>3</sup>Includes exports of 10,000 metric tons in both 1965 and 1966, directly by JNG. The National Grain Board.



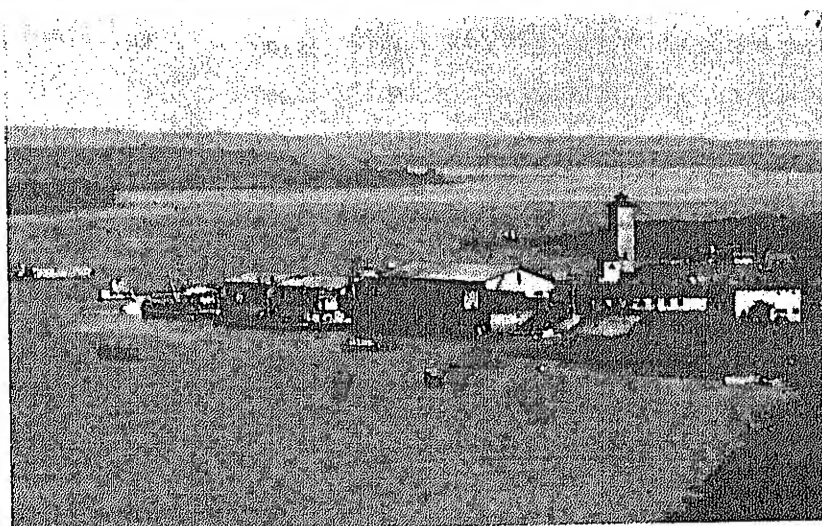
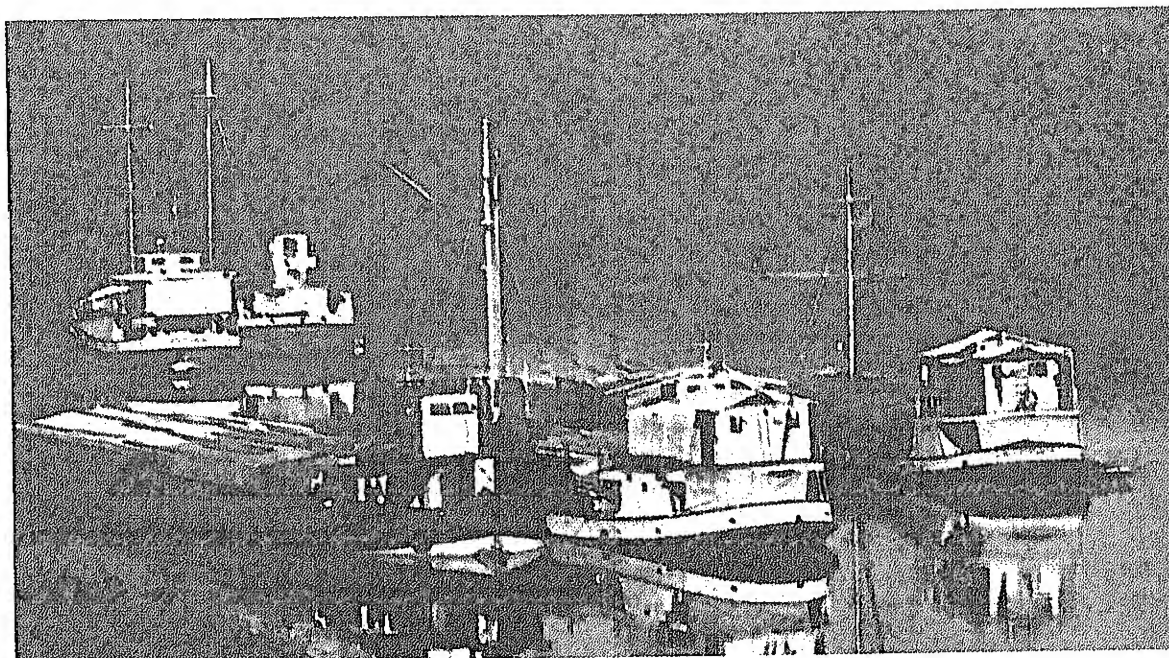
## TUNG OIL PRODUCTION AND MARKETING

The 1970-71 Argentine acreage devoted to tung cultivation approximates 56,740 hectares, up from 1968 and 1969, when 50,200 hectares were in tung.

Misiones Province continues as the major tung-producing region of Argentina, accounting for 49,800 hectares or about 97 percent of the total. Corrientes, an adjoining Province, also in the northeast portion of the Argentine, accounts for the remaining area under tung.

In the major tung producing region of Misiones, the north and northwestern portion, the tung trees

were planted in the early 1940's and heavy new planting for replacement appears to have been added in 1960-65. In this region, tung competes for acreage with tea, fruit, and, more recently, Brazilian pine being grown on many of the older plantations. In the southern portion of Misiones, the tung trees are generally quite young, about 5 years of age, and have only recently become economical to harvest. It is estimated that well over 80 percent of the tung trees of Misiones are in the north and west, the remainder is in the south.



Above, shallow draft riverboats such as the ones used to move tung oil the long distance from Misiones Province to export from the port of Buenos Aires. Left, a major internal terminal in Misiones for the movement of tung oil down the Parana River.

## Cultivation and Harvesting

Tung trees are planted from 10 to 15 feet apart, in rows up to 20 feet wide and up to 250 trees per hectare. There is little evidence that any fertilizer is applied on most plantations, although some growers admitted to some application. While many tung plantations give the impression of little continuing care, most experienced growers maintain close weed control through hand operations (no herbicides are used). Fungus growth that frequently starts on older limbs is very prevalent, and when not controlled, spreads to the main tree, and in severe cases can cause damage.

The frosts which appear periodically during the winter months (June — August) generally help the tree to set fruit and unless very severe and during the flowering period cause no damage.

The tung nut, which develops during the spring and summer, is harvested in the April — July period. Only hand harvesting is used. Labor includes mostly non-European local help and considerable migratory laborers from Paraguay. Nuts are harvested in tins; four tins make up a bag. Labor costs ranged up to ½ new peso per tin or 2 pesos per bag in 1970. Up to three harvests are common as nuts mature at different intervals and may have 15 — to 35 — percent moisture when gathered. Tung nuts are generally loaded on trucks for delivery on the local tung factory for processing into oil. It is estimated that up

to 95 percent of tung nuts produced in 1970 were harvested for oil processing.

## Processing of Tung Nuts

Following the gathering of tung nuts, which may continue into July, the nuts are further dried to a moisture content of 15 to 20 percent. Most drying of tung nuts between the plantation and the mill is open air; little heat drying is used. The desirable range of moisture content for nuts delivered to the factory is 10 to 14 percent.

Tung oil processing in Argentina generally does not begin before August (Paraguay begins in late July). the delay between harvesting and initial processing is to permit the tung nuts to dry properly; dehulling equipment cannot handle high moisture nuts.

With the completion of the Formosa tung plant, total tung nut processing capacity of Argentina is estimated at about 800 tons daily, or nearly 238,500 annually. However, in any one year, the quantity of tung nuts process for oil is not likely to exceed 150,000 to 175,000 tons.

The processing year begins about August 1 and continues to July 30. Since the quantity of tung nuts available for processing falls well below existing capacity of the mills, the Argentine Government and industry have shown an interest in processing soy-

TABLE 18—ARGENTINA TUNG NUT PROCESSING PLANTS, MISIONES AND FORMOSA PROVINCES, AVERAGE 1965-1970

Name	Location	Capacity	
		Daily	Annual
Misiones Province:		<i>Metric tons</i>	<i>Metric tons</i>
Cooperativa Agricola Eldorado- - - -	Eldorado - - - -	150	45,000
Ind. Oleg. Eldorado - - - - - - - -	Eldorado - - - -	150	45,000
Oleaginosa, Campo Grande, S.A. - - -	Campo Grande -	<sup>1</sup> 150	45,000
Santo Pipo Tungoil S.C.L.- - - - -	Santo Pipo - - - -	125	37,500
Coop. Agrícola Ltd. de Obera - - - -	Obera - - - - -	70	21,000
Coop. Agr. Ltd. de Picada Libertad	L. N. Alem - -	50	15,000
Formosa - - - - - - - - - - - - - -		<sup>2</sup> 100	30,000
Total capacity - - - - - - - - - -		795	238,000

<sup>1</sup> The De Smet solvent units may, in the future, be used for soybean processing at several facilities in the area.

<sup>2</sup> Under construction in 1970.

beans during the May to August slack period. To date, however, soybeans produced in Misiones have been shipped to Santa Fe for processing.

The old continuous press plants are being replaced with modern continuous (residual) solvent extraction units (De Smet, Belgium). The initial solvent unit was established in 1966, and at least two such plants are now operational with an additional direct solvent unit expected to go on stream in 1970. Not only are the solvent units more economical—they produce a somewhat higher oil outturn—but they also will reduce the need to carry over tung nuts from peak production years to the following year, a practice which was common until 1966-67.

A representative sample of oil outturn in the Eldorado area in the Northern Zone of Misiones, versus Misiones as a whole (August-July Crop year) is as follows.

	Eldorado area	Misiones
	Percent	Percent
1960 - - - - -	15.7	15.9
1961 - - - - -	18.4	15.0
1962 - - - - -	16.7	16.2
1963 - - - - -	18.4	15.0
1964 - - - - -	16.1	16.7
1965 - - - - -	16.8	20.1
1966 - - - - -	16.9	13.7
1967 - - - - -	19.2	19.6
1968 - - - - -	17.6	17.5
1969 - - - - -	18.7	18.0
1970 (estimated) - - -	18.5 - 19.0	(1)

<sup>1</sup> Not available.

The tung hulls and residual extraction residues have little value. Small quantities are used for fertilizer (probably on fruit trees), but most is burned for fuel in the tung nut processing plant.

### Production and Exports

Tung nuts harvested in 1970 indicate a production of 148,000 metric tons. This is substantially higher than the 68,300 tons produced in 1969. Factors contributing to the higher 1970 production include:

- Improvement of cultivation practices and increased harvesting of fallen nuts in 1969 as a result of better prices that year than in the previous 2 years;

- Improvement in the road system and rail connections to factories;

- Production from new trees in the southern portion of the Province.

Production in 1971 is estimated at 110,000 tons. The decrease was reportedly due to two factors: (1) Higher salaries and cost increases which led to a harvest that was below total plant production, and (2) damage to fallen nuts from rainfall and soil humidity resulting from delays in harvesting.

Tung oil production increased consistently from the 3,000-ton level of 1946-50 to well over 20,000 tons in the last half of the 1960's. Almost all the production goes into export, which supplies a limited demand for this technical oil in primarily industrialized markets, mainly, the United States and Western Europe. Argentina, which earlier displaced tung oil supplied by Mainland China, is now experiencing serious competition from Paraguay.

### Stocks and Storage

Until the late 1960's, small quantities of tung oil were stored at the processing plants in Misiones. This practice was necessitated by the limited transportation facilities available to export terminals, mainly at Buenos Aires. During this period, river transport on the Parana was frequently interrupted by low water or rapids, necessitating up-river storage. However, with new roads and rail connections from southern Misiones, tung is moved to export position as rapidly as rull tank, rail, or barge shipments are available. Storage facilities at plants in Misiones have capacities ranging between 1,000 and 3,000 tons, and tank storage space in Buenos Aires commonly used for tung oil is estimated between 11,000 and 15,000 tons. However, additional storage space in Buenos Aires could be readily provided.

### Prices

The mid-1970 nominal New York City price of 24 cents per pound for tung oil was attractive to exporters and growers in Argentina. In their view, a price ranging between 20 cents and 24 cents per pound, NYC basis, would be an incentive to producers. Prices have declined sharply, however, and in November 1971 were below 13 cents per pound—near the low for the year. At these prices, large quantities of tung nuts probably remained unharvested in 1971.

Exporters, however, note with concern the decrease in apparent consumption of tung oil in the United States and Western Europe, the increased supplies of linseed oil in 1971, and the probable high carryover of tung oil stocks in Argentina by June 1971.

TABLE 19--ARGENTINE PRODUCTION COST AND NET RETURNS  
SUMMARY FOR SUNFLOWERSEED, FLAXSEED, CORN AND WHEAT, 1969-70

Item	Sunflowerseed			Flaxseed		
	Pesos per hectare	Dol. per hectare	Percent	Pesos per hectare	Dol. per hectare	Percent
Fixed costs:						
Building and soil.....	5.01	1.25	3.1	5.09	1.27	3.3
Equipment.....	11.71	2.93	7.1	11.62	2.91	7.5
Taxes.....	5.37	1.34	3.1	6.75	1.69	4.3
Total.....	22.09	5.52	13.3	23.46	5.87	15.1
Variable costs:						
Interest.....	17.88	4.47	10.8	18.78	4.70	12.1
Seed and pesticides.....	8.36	2.09	5.1	28.91	7.23	18.6
Harvesting and storage.....	52.55	13.14	31.8	40.32	10.08	26.0
Repairs, fuel, lubricant.....	20.00	5.00	12.1	19.43	4.86	1.17
Labor and day wages.....	7.25	1.81	4.4	4.67	1.25	3.4
Insurance.....	4.22	1.06	2.6	5.26	1.32	3.0
Transportation.....	33.11	8.28	20.0	14.44	3.61	9.3
Total.....	143.37	35.84	86.7	131.81	32.95	84.9
Total Cost:	165.46	41.36	100	155.27	38.82	100
Returns:						
Yield <sup>1</sup> kg/ha.....	846	—	—	809	—	—
Price per kg.....	2953	.0738	—	3007	.07517	—
Gross returns.....	249.82	62.45	—	244	61	—
Net returns.....	84.36	21.09	—	88.73	22.18	—
Net returns as share of gross.....	—	—	33.8	—	—	36.4
Net returns as share of cost.....	—	—	51.0	—	—	57.1

	Corn			Wheat		
	Pesos per hectare	Dol. per hectare	Percent	Pesos per hectare	Dol. per hectare	Percent
Fixed costs:						
Building and soil.....	5.35	1.34	2.4	4.74	1.19	3.2
Equipment.....	12.66	3.17	5.8	11.25	2.81	7.4
Taxes.....	6.67	1.67	3.0	6.95	1.74	4.6
Total.....	24.58	6.17	11.2	22.94	5.74	15.2
Variable costs:						
Interest.....	20.15	5.04	9.2	16.81	4.20	11.1
Seed and pesticides.....	18.24	4.56	8.3	16.16	4.04	10.7
Harvesting and storage.....	52.93	13.23	24.1	26.92	6.73	17.8
Repairs, fuel, lubricant.....	22.55	5.64	10.3	19.73	4.93	13.0
Labor and day wages.....	8.41	2.10	3.8	4.62	1.16	3.1
Insurance.....	4.57	1.14	2.1	5.80	1.45	3.8
Transportation.....	68.03	17.01	31.0	38.22	9.55	25.3
Total.....	194.88	48.72	88.8	128.26	32.07	84.8
Total cost.....	219.56	54.89	100	151.20	37.80	100
Returns:						
Yield.....	2,330	—	—	1,352	—	—
Price per kg.....	0.1650	0.04125	—	0.1671	0.04177	—
Gross returns.....	384	96	—	226	56.50	—
Net returns.....	164.44	41.11	—	74.80	18.70	—
Net returns as share of gross.....	—	—	42.8	—	33.1	—
Net returns as share of cost.....	—	—	74.9	—	49.5	—

<sup>1</sup> Estimate from *Revista de la Bolsa de Cereales, Numero Estadistico 1970*.  
NOTE: At 1970 rate, 4.00 pesos = 1 U.S. dollar.

## PRODUCTION AND MARKETING OF FATS AND OILS

### Transportation Costs

Argentina has three major export ports, located at Rosario, Bahia Blanca, and Buenos Aires. Shipments from the major inland producing areas tend to favor the port location that is the closest. Oilseeds and products are shipped by either rail or truck from most of the areas. The major exception is tung oil, which moves largely by boat from Misiones Province, mainly because tung crushing plants are located adjacent to the river.

Most oilseeds are shipped in bags to storage locations and crushing facilities. Although the government has been trying to encourage a shift to bulk shipments, there has been little incentive, as freight rates on a bagged basis are the same as bulk, whether shipped by rail or truck.

Rail rates vary, depending on the type of oilseed and distance traveled. Over the same distance, freight rates for sunflowerseed and peanuts are higher than those for linseed and soybeans. In the case of truck shipment, the rate is highest for sunflowerseed. Truck transportation differs from that in the United States since trucks run in tandem and are able to carry double the cargo with one cab, and distances traveled are generally less than 300 miles. The rail rates for the different oils (sunflower, peanuts, soybean, and linseed) are the same from a given production area to

port locations. The rates are also the same for the different meals. Of course, the further the production area from port location, the higher the cost.

A determination of the least expensive way of shipping oilseeds or products to export location required comparison of the rate on an equivalent basis. The sum of the rates of oil and meal times their rates of outturn are comparable to the oilseed rates. These data indicate that transportation rates favor the crushing of sunflowerseed and peanuts in the producing areas, whereas the lower rate for flax as seed favors movement of raw material rather than products. (Table 19). This would tend to justify location of flaxseed crushing facilities at port positions.

### Storage Capacity for Oil

Argentina has storage capacity at crushing plants of 260,000 metric tons. These storage tanks are located in five north-central and eastern Provinces: Buenos Aires and Santa Fe, Cordoba, Entre Rios, and Chaco. However, Buenos Aires and Santa Fe account for 80 percent of the storage space. Most of the tanks are used as mixed storage for both inedible and edible oil. About 25 percent of the capacity is used for inedible oil only, while 15 percent contains edible oils exclusively.

TABLE 20— OIL STORAGE CAPACITY OF ARGENTINE  
CRUSHING PLANTS  
[In metric tons]

Location	Inedible	Mixed	Edible	Total
Federal Capital (Buenos Aires) . . . . .	4,000	3,000	—	7,000
Provinces:				
Buenos Aires . . . . .	29,470	78,511	19,150	127,131
Santa Fe . . . . .	4,700	75,200	3,400	83,300
Cordoba . . . . .	—	10,640	6,000	16,640
Entre Rios . . . . .	23,035	1,900	—	24,935
Chaco . . . . .	—	—	4,810	4,810
Total . . . . .	61,205	169,251	33,251	263,816

The National Grain Board.

Argentine ports are able to store 83,000 metric tons of oil. All of these ports are located in the Provinces of Buenos Aires and Santa Fe, either along the South Atlantic Coast or the Parana River. There are some storage facilities for tung oil in Misiones Province, where tung is produced, and tung oil is also shipped down the Parana River and stored at Buenos Aires. The ports and their respective oil storage capacity (in metric tons) are:

	Capacity
Buenos Aires .....	21,600
Santa Fe .....	3,750
Rosario .....	20,500
San Lorenzo .....	20,000
San Martin .....	14,124
Bahia Blanca .....	3,000
Total .....	82,974

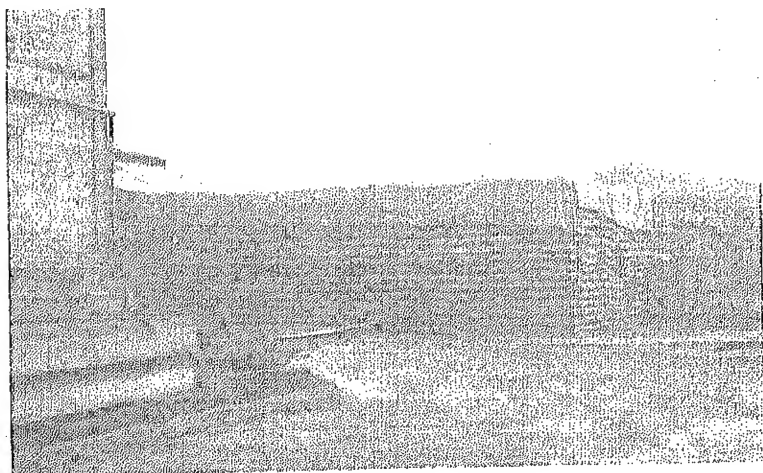
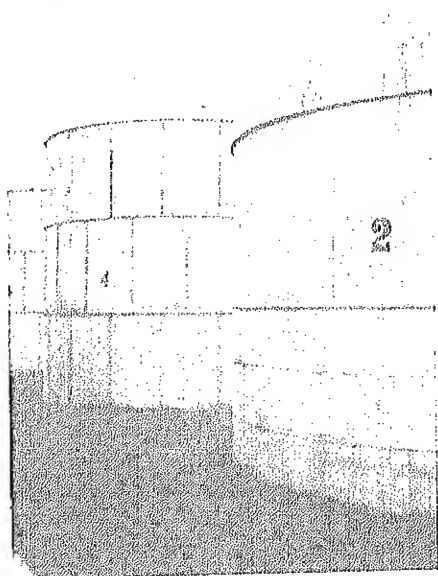
#### The National Grain Board

The loading charge for oil from tank to boat is about 10 percent higher than the charge for loading into trucks.

#### Oilseed Crushing Facilities

The oilseed crushing industry of Argentina is located in the Pampaeen Region in the Provinces of Buenos Aires, Chaco, Cordoba, Entre Rios, and Santa Fe. Tung nut processing is concentrated in Misiones Province. Small quantities of olive oil are produced in Cordoba, Mendoza, and San Luis. The Buenos Aires area, including the Federal Capital, is by far the major oilseed processing region, accounting for almost half of the country total.

The oilseed processing industry of a Province is characteristically determined by the local production of oilseeds. Sunflowerseed processing ranks first in Buenos Aires and Santa Fe Provinces, is also important in Cordoba, but is of less importance in Chaco and Entre Rios. Cordoba is the most important producer/processor of peanuts, while Chaco is the major cottonseed processor followed by Santa Fe. Flaxseed is the major oilseed processed in Entre Rios and ranks second to sunflower in Buenos Aires. Tung nuts are produced and processed almost exclusively in Misiones Province.



*Clockwise from above. Bulk storage for vegetable oil—seen throughout Argentina but heaviest in Buenos Aires; trucks transporting vegetable oil—the most common means of transport; and bagged crushing peanuts waiting to be processed.*



There also tends to be a concentration of crushing facilities at export points, particularly in the city of Buenos Aires. Over 35 percent of the total crushing capacity of the country is located near this port.

During 1965-70, Buenos Aires continued to increase its domination of the Argentine oilseed crushing industry, and efforts to shift the flaxseed crushing industry from Entre Rios were largely unsuccessful.

Buenos Aires is the most important oilseed-processing region of Argentina, accounting for nearly 1.6 million tons of capacity, or 45 percent of the total; solvent extraction capacity accounts for over 700,000 tons, pre-press solvent for an additional 330,000 tons, and the remaining 500,000 tons includes continuous screw presses (Table 21). The five continuous solvent extraction units have been expanded in recent years. Most solvent and pre-press solvent units in the Province operate on all three major oilseeds—flax, peanuts, and sunflower. The generally small plants operate on flaxseed or sunflower but do not attempt to run continuous lines on both oilseeds.

Buenos Aires, although the center of the country's oilseed processing, is a deficit producing region. Thus, while oilseed processing capacity approximates 1.6 million tons, oilseed production in the Province averaged less than 840,000 tons in the 1965-70 period. Thus, Buenos Aires relies heavily on the influx of oilseeds from other "surplus" producing Provinces like Cordoba and Chaco. There is some indication that the Buenos Aires area has been successful in drawing oilseeds, particularly peanuts and sunflower from Cordoba, flaxseed from Entre Rios, and sunflower from Chaco to its mills.

Santa Fe, north of Buenos Aires Province, ranks second in processing capacity, with about 945,000 tons, or 27 percent of the country's total. Solvent extraction capacity exceeds 350,000 tons, pre-press solvent, about 300,000 and continuous presses, the remaining 290,000. Several mills have been expanded in recent years, including one large solvent and one pre-press solvent plant and the continuous solvent plant at Reconquista. The latter plant draws its raw material supplies in part from other Provinces including Cordoba, Chaco, Tucuman, and Corrientes.

As in Buenos Aires, the oilseeds produced locally are well below the operational capacity of the Provinces' mills. Soybeans originating in Tucuman and Misiones are processed at the batch solvent plant at San Martin. The meal is pelleted and sold in Argentina. The soybean oil is blended with sunflower oil and sold locally. The larger solvent extraction plants of Santa Fe also process flaxseed. As these mills have lower unit operating costs than those in Entre Rios, there is expected to be a gradual shift in flaxseed processing out of Entre Rios into Buenos Aires and Santa Fe. Peanuts processed in Santa Fe are produced in Cordoba.

Cordoba, Argentina's peanut-producing region, ranks third in oilseed processing capacity with about 400,000 tons, or 11 percent of the national total. Unlike Buenos Aires and Santa Fe, however, Cordoba, has nearly 60,000 tons in solvent extraction capacity, 115,000 in pre-press solvent, and the remaining 225,000 in continuous presses. In addition to peanuts, Cordoba processes sunflower and flaxseed, but quantity of flaxseed produced has declined sharply in recent years.

TABLE 21—ESTIMATED ARGENTINE OILSEED PROCESSING CAPACITY, BY PROVINCE AND TYPE, 1970

Item	Buenos Aires	Chaco	Cordoba	Entre Rios	Santa Fe	Total
Solvent extraction:						
Operational units . . . number . . .	12	2	1	1	5	21
Capacity:	2,155	400	170	75	1,070	3,870
Daily . . . tons . . . . .	719,770	133,600	56,780	25,050	357,380	1,292,580
Annual . . . tons . . . . .						
Pre-press solvent:						
Operational units . . . number . . .	1	—	1	—	2	4
Capacity:	1,000	—	350	—	880	2,230
Daily . . . tons . . . . .	334,000	—	116,900	—	293,920	744,820
Annual . . . tons . . . . .						
Continuous presses:						
Operational units . . . . .	22	4	8	16	14	64
Capacity:	1,595	140	665	990	875	4,265
Daily . . . tons . . . . .	532,730	47,760	222,110	330,660	292,250	1,424,510
Annual . . . tons . . . . .						
Total operational units . . . number . .	35	6	10	17	21	89
Total daily capacity tons . . . . .	4,750	540	1,185	1,065	2,825	10,365
Total annual capacity tons . . . . .	1,586,500	180,360	395,790	355,710	943,550	3,461,910

Peanut and sunflower production is increasing, however. In 1971, following a break in the prolonged drought, the production of peanuts increased sharply and probably will exceed the milling capacity of the Province. The excess supply will be shipped to the Santa Fe, Buenos Aires regions where additional capacity is available. Peanuts are sampled at the plant, and high-quality edible varieties are separated and shipped to edible nut factories in Santa Fe.

Entre Rios is characteristically the country's flaxseed/linseed oil producing-processing area. The Province's total capacity approximates 350,000 tons and includes only one small solvent plant of 25,000 tons annual capacity, no pre-press solvent units, but 16 continuous press plants. While Buenos Aires Province purchases and processes more flaxseed than Entre Rios, about 90 percent of the raw material used in Entre Rios is flaxseed and the remaining 10 percent sunflowerseed. The flaxseed expeller plants are small, and as many as 50 are reported to have ceased operation in the last decade. This has been caused in part by the shipment of flaxseed to the more efficient mills in Buenos Aires and Santa Fe.

Margins on processing flaxseed are the lowest of any major oilseed. Further, with the decline in linseed oil exports, there has been some effort devoted to encouraging an expansion in peanut and sunflower production in the Province. Efforts to date have been only moderately successful.

The Chaco cotton-producing area has a seed processing capacity of about 181,000 tons, or 5 percent of the country's total. As expected, the area concentrates on cottonseed processing in its six mills, the largest of which are solvent units that can process 134,000 tons of seed annually. Small quantities of sunflowerseed are also processed in Chaco. There appears to have been little change in the size and structure of the processing region of Chaco in recent years. Changes that do take place tend to reflect the area's attitude toward cotton production.

Misiones, the center of tung tree cultivation in Argentina, is excluded in the discussion of oilseed crushing plants. The Province's tung processing is discussed in a separate section. Should these mills undertake the processing of locally produced soybeans, however, as is being considered, their capaci-

## ARGENTINA: CALCULATED GROSS PROCESSING MARGINS FOR PEANUTS, SUNFLOWER AND FLAXSEED

U.S. DOLLARS PER METRIC TON

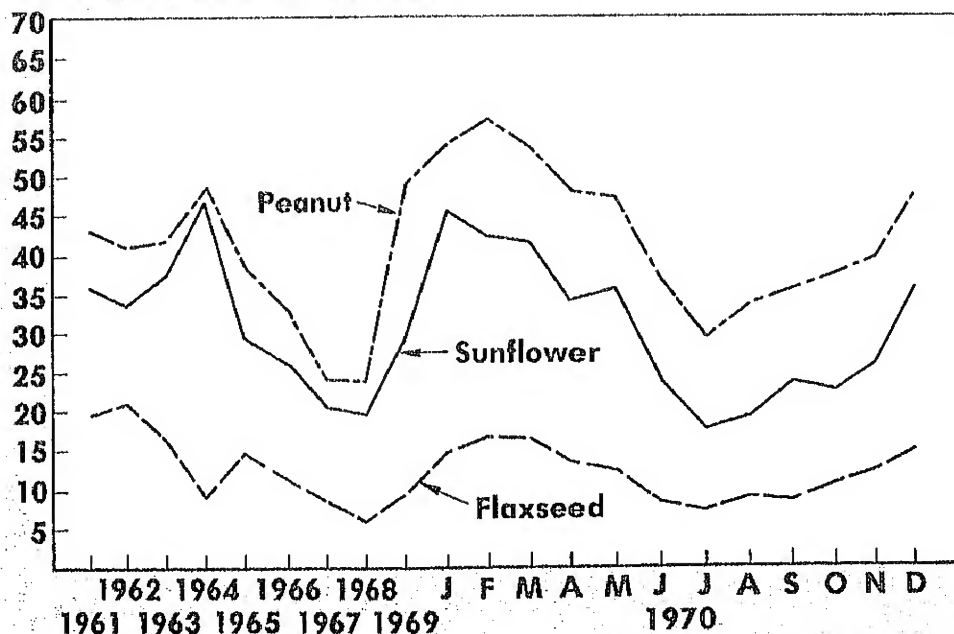




TABLE 22--ARGENTINE EDIBLE OIL SUPPLY AND DISTRIBUTION<sup>1</sup>

Item	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons
Supply:											
Beginning stock .....	47.3	43.4	40.1	19.3	29.5	19.5	51.0	30.8	58.7	21.5	18.3
Production .....	271.0	259.1	306.3	274.3	225.4	398.6	412.6	451.9	399.4	338.1	465.0
Imports .....	-	-	-	-	(2)	(3)	(4)	-	-	-	-
Total supply .....	318.3	302.5	346.4	293.6	254.9	418.1	463.6	482.7	458.1	359.6	483.3
Distribution:											
Exports .....	79.7	66.3	130.1	50.6	10.4	103.2	166.3	157.1	153.2	62.7	147.9
Domestic consumption ..	195.2	196.1	197.0	213.5	225.0	263.9	266.5	266.9	283.4	278.6	308.3
Ending stock .....	43.4	40.1	19.3	29.5	19.5	51.0	30.8	58.7	21.5	18.3	27.1
Total distribution .....	318.3	302.5	346.4	293.6	254.9	418.1	463.6	482.7	458.1	359.6	483.3
Per capita oil consumption <sup>1</sup> .....	Kg. 9.4	Kg. 9.3	Kg. 9.2	Kg. 9.8	Kg. 10.1	Kg. 11.7	Kg. 11.6	Kg. 11.5	Kg. 12.0	Kg. 11.6	Kg. 12.6

<sup>1</sup> Excludes minor oils; ie., rapeseed oil, corn oil, soybean oil, and grapeseed oil.

<sup>2</sup> Imports of soybean oil from the United States were 13.7 tons.

<sup>3</sup> Imports of soybeans from the United States were 12.0 tons.

<sup>4</sup> Imports of soybeans from the United States were 1.5 tons.

ties should then be considered in the seed processing complex.

### Crushing Margins

On the basis of gross processing margins for 1961 through 1970 and monthly data for 1970 and 1971, the following conclusions appear justified:

◦ Peanut processing continues to be the most profitable for Argentine oilseed crushers, with margins having averaged about \$38.00 per metric ton in the 1961-70 period. Margins on peanut processing reached record monthly levels in early 1970, exceeding \$55 per ton, fell back to under \$30 per ton during the middle of the year, only to rise again to just below \$50.00 at the year's close. In 1971, record levels were again reached. In March, the margin surpassed \$60.00 per ton before beginning its seasonal drop.

◦ Sunflower processing ranks second only to peanuts in profitability to the processor and have a trend in margins similar to that for peanuts. Margins on sunflowerseed averaged \$31 per metric ton between 1961-70. Monthly margins rose to \$45 per ton in early 1970 before declining to below \$20. Sunflowerseed margins, however, did not rebound as well as peanuts, as early 1971 margins did not rise above \$35.00.

Factors limiting increased sunflower processing include basic difficulties in increasing the sunflower crop—competition for land, low yields, high incidence of disease, high abandonment, and low oil content in varieties adopted to cultivation. However, as these are all factors that show signs of improvement, investment in sunflowerseed processing facilities (solvent) continues to increase, and prospects for increased sunflower production and exports of oil and meal appear good.

◦ Processors find flaxseed the least attractive of the three major oilseeds. Margins averaged \$13 per metric ton in the 1961-70 period and rose to \$16 in

early 1970, a level not quite reached in 1971. Argentine flaxseed production has been well maintained in the face of oversupply and declining world prices. With old screw-press plants, located primarily in Entre Rios, being expanded, and many plants closing, the quantity of Argentine flaxseed crushed remained essentially unchanged. The mills remaining with relatively high operating costs are crushing larger quantities of seed.

With crushing margins likely to deteriorate in the years ahead, reflecting world market conditions, a gradual reduction in Argentine flaxseed production, processing, and oil meal exports is probable. Should the Grain Board sharply lower or fail to maintain supports for seed and oil production, acreage and processing will switch to other crops, including more profitable oilseeds. Some switch from linseed to sunflowerseed production has been occurring in Entre Rios, Santa Fe, and the northern part of Buenos Aires Provinces. However, acreage planted to linseed in southern Buenos Aires has continued to increase, as linseed and wheat are the major production alternatives in this region because of the shorter growing season.

### Consumption of Oil and Fat in Argentina

Argentine per capita consumption of edible oils, excluding minor oils, is currently about 12.0 kilograms, up from a little over 9 kilograms per capita in the early sixties. U.S. per capita consumption of vegetable oil by comparison, totaled 17.4 kilograms in 1969, up from 12.2 in 1960.

Total Argentine consumption currently amounts to about 280,000 metric tons of edible oil annually, a 40 percent increase over the 195,000 ton level in 1960. This calculation takes into account changes in oil stock levels (Table 22).

Looking at changes in apparent consumption of all edible oils (production plus imports minus exports) for a longer period of time, it appears there has been

TABLE 23-ARGENTINE SUPPLY AND DISTRIBUTION OF EDIBLE OIL

Year	Production	Imports	Exports	Apparent consumption	Per capita consumption
	<i>Metric tons</i>	<i>Metric tons</i>	<i>Metric tons</i>	<i>Metric tons</i>	<i>Kg.</i>
1936-40 - - - -	84,041	12,785	346	96,480	7.0
1941-45 - - - -	201,687	115	73,233	128,569	8.6
1946-50 - - - -	256,838	120	71,195	185,763	11.4
1951-55 - - - -	204,741	-	25,649	179,092	9.8
1955-60 - - - -	270,276	554	51,836	217,886	10.9
1961-65 - - - -	296,107	9	223,928	72,188	10.3
1966-69 - - - -	421,677	-	114,665	307,012	13.1

National Grain Board and National Institute of Statistics and Census.

a consistent upward trend in edible vegetable oil consumption (sunflower, cottonseed, peanut, rapeseed, olive, etc.) with an above-trend increase in the 1946-50 period due to excellent supplies and a high rise in per capita income.

One final significant aspect of vegetable oil consumption in Argentina is that between 1960 and 1969 there was an increasing reliance on sunflowerseed oil to supply consumption requirements, increasing from 85 percent in 1960 to 95 percent in 1968 and 90 percent in 1969. However, when sunflowerseed oil is in rather short supply, peanut oil is diverted from the export sector to fill the supply gap. Some quantities of cottonseed and olive oil also go into domestic consumption, but sunflowerseed oil remains the primary oil demanded by the domestic market. This necessarily influences the amount of sunflowerseed oil available for export, as domestic requirements are filled first.

Per capita consumption of animal fats, an inferior product relative to vegetable oil for edible purposes, has declined in relation to the large increases in consumption of vegetable oil. Argentine consumption of fats in 1970 was under 3 kilograms per person. Annual consumption, however, has maintained a level of over 60,000 metric tons during the last 5 years (1967-1971). About two-thirds of the animal fats consumed are tallow and the remainder is lard, as indicated in the following tabulation (in metric tons).

	Lard	Tallow
1967 - - - - -	21,920	44,849
1968 - - - - -	16,880	81,003
1969 - - - - -	20,557	
1970 - - - - -	17,500	46,543
1971 - - - - -	21,500	40,300

## Oilseed and Oil Support Prices

The National Grain Board establishes support prices for oilseeds and oils. Many times the support levels are not announced until after the crop is already planted. The support price is the level at which the Government purchases the commodity and acts somewhat as a floor price. However, the National Grain Board does not pay the producer cash for his crop at the time of delivery and in some cases the Board does not have the funds to purchase the entire offerings.

It is unsettling to the farmer when he takes his crop in to sell to the Board and finds it does not have any money with which to buy. Therefore, many farmers are willing to sell oilseeds to processors below the support level for cash on delivery or for better terms than offered by the Board.

In an effort to protect the farmer against unduly depressed prices, the Board established a minimum price for the 1966-67 crop year. This was a price below which sales are not permitted.

In terms of the U.S. dollar, oilseed support prices have declined substantially since 1945-46. The only oilseed that is an exception is soybeans. The support price was raised substantially in 1971-72 to \$91 per metric ton, compared with \$54 in 1966-67.

A linseed oil support price was announced in 1968-69 at \$160 per metric ton. Over 75,000 tons of linseed oil have been acquired under the support program during the past 3 years. Since 1960, linseed oil has been by far the major oil purchased by the Board.

One purchase has been made of soybean oil and one of sunflowerseed oil. Applicable support and exchange rates during this period were as follows: 1968-69, 560 new pesos (or \$160 per metric ton), 1969-70, 560 pesos (\$140 per metric ton), 560 pesos (\$119 per metric ton.)

## OILCAKE AND MEALS

Argentine exports of cakes and meals have varied between 700,000 and 1 million metric tons during the past decade. The significant development that has taken place in this sector is the decline in exports of expeller and meal in favor of pellets. In 1964, the exports of pellets began to take place, and by 1969 they represented 50 percent of the total.

### Sunflower

Sunflower cake and meal production reached a record of 486,000 tons in 1970. This was well above the 1969 level of 313,000 tons and continued the upward trend that began in the mid-1950's (Table 24). Since 1960, Argentine sunflower cake and meal production has more than doubled, and barring harvesting difficulties such as prevailed in 1971, some further increase in production seems probable.

Significantly, however, the portion of Argentine sunflower cake and meal production being retained for domestic consumption increased sharply in recent years. It is too early to speculate, but the 23 percent of sunflower cake and meal production that appears to have been used domestically in 1969 signals the beginning of the expansion of protein meal used in the mixed feed industry. This development could parallel the U.S. pattern, where poultry feeding increased substantially in the early years and then leveled off to some extent. Through 1966, essentially all Argentine cake and meal was exported. Since 1967, only about 85 percent of sunflower meal production has been exported, the remainder is being consumed by the country's developing mixed feed industry (Table 25).

Production data does not indicate the type of sunflower meal produced in Argentina. However, from the export figures, we can conclude that essentially all solvent extracted sunflower meal produced is converted to pellets (Table 26). Pellet production and exports appear to have begun in 1964 and showed a rapid annual increase through 1970. Sunflower meal was the most important category until 1964, when meal was converted to pellets to take advantage of lower ocean transportation rates. Sunflower cake production paralleled the development in meal and began a steady decline in 1966.

Exports of Argentine sunflower cake and meal are now almost entirely in the form of pellets. Argentine

pellets from extracted sunflower meal are quoted for export with a protein content of 38 percent.

A sample pellet obtained in Santa Fe Province indicated the following analysis: Oil, 2.1 percent; protein, 33.9 percent; fiber, 19.5 percent; moisture, about 8 percent. A rough calculation based on fiber content indicates about 30-35 percent hulls. As the original fiber content of seed probably did not exceed 45 percent, the dehulling was poorly done, or hulls had been added back into the meal. The oil content also appears high for a pre-press solvent extracted meal converted to pellets.

Of the 291,081 tons of sunflower cake and meal exported by Argentina in 1969, 137,157 tons, or nearly half the total, went to the Netherlands (Table 27). Other major export destinations included the United Kingdom (55,258 tons), West Germany (35,127), and Belgium (28,042).

Argentine exports of sunflower pellets to Spain have increased sharply in recent years. Between 1960 and 1967, sunflower meal exports rose from 217,916 tons to 394,262, increasing at an annual rate of 10 percent. In 1968 and 1969, exports of Argentine sunflower pellets actually declined, reflecting reduced domestic production and some increase in requirements, but they recovered in 1970 to over 400,000 tons. Exports of Argentine sunflower cake and meal probably declined in 1971, as the domestic crop appeared to be well below the 1970 level.

### Flaxseed

Linseed expeller production ranks second only to sunflower in Argentina. In 1970, linseed cake and meal production rose to 482,000 tons, or 43 percent above the 1969 level of 336,695. Argentine production of linseed cake reached a peak in the 1963-1965 period of about 485,000 tons, fell sharply in 1966-69, and then rebounded again in 1970. In view of the probable continued world surplus of linseed oil and relatively unattractive margins for flaxseed processors, Argentine production of linseed cake is expected to decline again in the 1970-75 period.

Again, the only source of the type of linseed protein produced is derived from export data. However, as essentially the entire domestic production was exported before 1969, this information is considered pertinent. Linseed expellers constituted about

TABLE 24-- ARGENTINE PRODUCTION OF OILCAKES AND MEALS BY TYPE

Year	Sunflower		Peanuts		Rapeseed	
	Quantity	Share of total	Quantity	Share of total	Quantity	Share of total
	<i>Metric tons</i>	<i>Percent</i>	<i>Metric tons</i>	<i>Percent</i>	<i>Metric tons</i>	<i>Percent</i>
Average:						
1946-50 -----	361,840	35	41,254	5	9,716	(1)
1951-55 -----	177,823	31	41,265	9	5,724	(1)
1956-60 -----	230,265	33	88,196	13	3,667	(1)
1961-65 -----	241,718	27	135,851	15	3,349	(1)
1966-69 -----	397,163	44	115,904	13	1,064	(1)
Annual:						
1960 -----	232,867	30	88,825	12	4,329	(1)
1961 -----	215,375	30	108,686	15	2,884	(1)
1962 -----	255,717	27	152,814	16	2,664	(1)
1963 -----	228,260	24	134,541	15	3,474	(1)
1964 -----	168,554	21	126,171	16	4,456	(1)
1965 -----	340,686	32	157,062	15	3,269	(1)
1966 -----	355,521	39	171,047	19	1,279	(1)
1967 -----	450,911	47	119,733	12	753	(1)
1968 -----	403,115	48	106,923	980	(1)	(1)
1969 -----	379,108	43	65,914	8	1,245	(1)

	Cottonseed		Linseed		Soybeans		Total
	Quantity	Share of total	Quantity	Share of	Quantity	Share of total	
	<i>Metric tons</i>	<i>Percent</i>	<i>Metric tons</i>	<i>Percent</i>	<i>Metric tons</i>	<i>Percent</i>	<i>Metric tons</i>
Average:							
1946-50 -----	58,222	8	391,080	52	--	--	762,112
88,924	88,924	15	253,646	45	--	--	580,382
1956-60 -----	76,015	11	292,753	43	--	--	690,896
1961-65 -----	77,620	9	436,656	49	--	--	895,194
1966-69 -----	70,275	8	305,093	34	4,895	(1)	894,394
Annual:							
1960 -----	57,954	8	378,325	50	--	--	762,300
1961 -----	77,569	11	311,240	44	--	--	715,736
1962 -----	72,187	8	457,517	49	--	--	940,899
1963 -----	72,902	8	486,454	53	--	--	925,631
1964 -----	68,844	8	444,931	55	--	--	812,956
1965 -----	96,600	9	483,140	44	--	--	1,080,757
1966 -----	82,700	9	290,532	33	--	--	901,079
1967 -----	65,200	7	328,986	34	--	--	965,583
1968 -----	49,500	6	264,160	32	9,197	(1)	833,875

<sup>1</sup> Less than 1 percent

75 percent of total production in 1960, and by 1969 their share had risen to over 95 percent. Linseed pellet production began in 1964 and reached a peak in 1965, before beginning a sharp decline, which continued through 1968 and then leveled off.

As in the case of sunflower, the Netherlands has been the major destination of Argentine linseed expeller cake (Table 28). In 1969, Argentina exported 143,737 tons of linseed expellers to the Netherlands, or over half of the total exports of 271,487. In 1970, linseed expeller exports rose to 330,000 tons, and the Netherlands remained the major outlet.

Other important destinations of Argentine linseed expellers include France, West Germany, Italy, and Belgium. Exports of linseed expellers to Denmark,

Norway, Finland, Switzerland, Sweden, and the United Kingdom appear to have reached a peak in the mid-1960's and fallen sharply in recent years. Declining domestic production of flaxseed is expected to limit future exports of linseed expellers to a level considerably below that of 1970.

### Peanut

Peanut cake and meal production rose slightly from 65,914 tons in 1969 to 91,000 in 1970. Argentine peanut cake and meal production, after climbing steadily in the 1946-1965 period, reached a peak of 171,047 tons in 1966, and then began a 3-year decline, which continued through 1969. (Table 25). Attractive world prices for peanut products and

TABLE 25 --- ARGENTINE PRODUCTION, EXPORTS, AND DOMESTIC USE OF OILCAKES AND MEALS <sup>1</sup>

Item	1965		1966		1967		1968		1969		1970	
	Quantity	Share of production	Quantity	Share of production	Quantity	Share of production	Quantity	Share of production	Quantity	Share of production	Quantity	Share of production
	Metric tons	Percent	Metric tons	Percent	Metric tons	Percent	Metric tons	Percent	Metric tons	Percent	Metric tons	Percent
<b>Production:</b>												
Sunflower .....	341	-	356	-	451	-	403	-	379	-	486	-
Peanut .....	157	-	171	-	120	-	107	-	66	-	86	-
Cottonseed .....	97	-	83	-	65	-	50	-	84	-	94	-
Linseed .....	483	-	291	-	329	-	264	-	337	-	482	-
Total .....	1,078	-	901	-	965	-	824	-	866	-	1,076	-
<b>Exports:</b>												
Sunflower .....	276	81	372	105	394	87	379	94	291	77	404	83
Peanut .....	132	84	181	106	117	98	103	96	46	70	65	76
Cottonseed .....	88	91	74	90	73	112	42	84	79	94	89	95
Linseed .....	555	115	314	108	345	105	274	104	271	81	337	89
Total .....	1,051	98	941	104	929	96	798	97	687	79	923	86
<b>Domestic use:</b>												
Sunflower .....	65	19	-16	-4	57	13	24	6	88	23	82	17
Peanut .....	25	16	-10	-6	3	2	4	4	20	30	21	24
Cottonseed .....	9	9	9	10	-8	-12	8	16	5	6	5	5
Linseed .....	-72	-15	-23	-8	-16	-5	-10	-4	66	19	45	11
Total .....	27	2	-40	-44	36	4	26	3	179	21	153	14

<sup>1</sup> Including sunflower, peanut, cottonseed, and linseed meals, but excluding soybean, rapeseed, and other miscellaneous meals.

TABLE 26-- ARGENTINE MEAL EXPORTS BY TYPE OF PROCESSING

[ In metric tons ]

Item	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
<b>Sunflowerseed:</b>											
Pellets.....	55,895	-	-	-	80,153	185,121	273,876	332,159	354,270	289,689	396,943
Expellers.....	55,895	68,850	72,877	59,827	22,370	31,729	35,328	23,338	3,726	-	6,841
Meal.....	160,911	175,052	181,049	157,508	78,733	58,928	61,899	38,811	21,186	1,392	-
Cake.....	1,110	4,700	1,492	-	47	-	549	-	-	-	-
Total.....	217,916	248,602	255,418	217,335	181,303	275,778	371,652	394,262	379,182	291,081	403,784
<b>Peanut:</b>											
Pellets.....	-	-	-	-	22,148	25,190	24,729	19,466	26,880	9,489	19,853
Expellers.....	31,499	47,958	88,743	66,221	71,810	98,409	152,570	93,221	75,466	36,113	44,086
Meal.....	63,792	58,078	71,007	48,545	27,779	8,143	3,952	3,372	-	-	-
Cake.....	-	1,470	-	-	-	-	-	265	650	424	673
Total.....	95,291	107,506	159,750	114,766	121,737	131,742	180,671	116,904	102,997	46,026	64,612
<b>Cottonseed:</b>											
Pellets.....	-	-	-	-	37,362	47,001	26,095	27,254	17,497	55,083	54,891
Expellers.....	22,685	22,333	50,516	48,985	27,943	29,335	32,165	36,165	22,675	21,880	33,311
Meal.....	27,809	23,976	16,507	5,256	8,107	6,602	11,229	7,217	587	-	-
Cake.....	14,796	17,270	21,012	6,702	5,236	5,341	4,689	2,436	775	1,839	650
Total.....	65,209	63,579	88,035	60,943	78,648	88,279	74,178	72,964	41,535	78,802	88,852
<b>Linseed:</b>											
Pellets.....	-	-	-	-	22,534	60,289	26,552	44,156	5,927	8,162	28,898
Expellers.....	313,441	302,955	436,429	449,851	439,440	478,225	286,939	300,413	267,306	260,279	331,586
Meal.....	69,243	57,357	75,566	38,596	20,430	13,539	121	-	480	-	-
Cake.....	12,509	23,594	-	1,998	158	3,264	498	199	750	3,046	4,815
Total.....	395,193	383,906	511,995	490,445	482,562	555,317	314,110	344,768	274,463	271,487	365,299
<b>Total:</b>											
Pellets.....	-	-	-	-	162,197	317,601	351,252	423,035	404,574	362,423	500,585
Expellers.....	423,520	442,096	648,565	624,884	561,563	637,698	507,002	452,983	369,173	318,272	415,824
Meal.....	321,755	314,463	344,129	249,905	135,049	87,212	76,621	49,980	22,253	1,392	-
Cake.....	28,415	47,034	22,504	8,700	5,441	8,605	5,736	2,900	2,175	5,309	6,138
Total.....	773,690	803,593	1,015,198	883,489	864,250	1,051,116	940,611	928,898	798,175	687,396	922,547

Note: Totals may not add due to rounding.

Instituto Nacional de Estadística y Censos.

TABLE 27---ARGENTINE SUNFLOWERSEED CAKE AND MEAL EXPORTS BY COUNTRY OF DESTINATION  
[ In metric tons ]

Destination	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
Germany, West .....	32,090	39,220	39,531	33,708	23,903	19,844	56,261	62,523	65,004	35,127
Belgium .....	8,922	14,463	13,818	15,509	18,258	34,548	34,090	57,631	62,722	28,042
Czechoslovakia .....	—	—	—	—	—	—	—	—	1,017	2,698
Chile .....	—	—	—	—	—	—	—	2,925	—	—
Denmark .....	9,696	2,529	3,256	8,836	9,667	14,908	1,352	—	1,240	600
Spain .....	—	—	1,239	198	1,487	2,188	7,107	5,933	12,165	21,141
Finland .....	—	—	—	—	—	—	—	495	—	—
France .....	2,095	3,183	6,452	12,364	6,687	10,448	2,628	2,487	1,689	1,503
Hungary .....	—	3,666	287	894	2,799	1,001	1,728	500	790	3,012
Canary Islands .....	—	—	—	—	—	—	99	—	—	—
Ireland .....	1,184	5,304	3,171	2,534	1,680	6,563	5,718	3,913	3,009	501
Italy .....	—	573	—	—	—	50	99	598	—	—
Netherlands .....	60,115	97,540	99,203	89,882	67,081	123,337	173,324	175,556	159,454	137,157
Peru .....	—	—	—	—	—	—	—	—	1,614	642
French Possessions .....	—	—	—	—	—	50	—	—	—	—
(Africa)	—	—	—	—	—	—	—	—	—	—
Norway .....	—	—	29	—	606	—	—	—	—	1,995
United Kingdom .....	98,977	81,311	87,590	49,695	49,135	58,951	83,549	81,400	70,257	55,258
Sweden .....	1,146	1,014	246	50	—	3,691	991	—	—	—
U.S.S.R. ....	—	—	—	—	—	—	5,706	—	—	—
Uruguay .....	—	—	—	—	—	199	—	—	221	—
Yugoslavia .....	—	—	—	3,465	—	—	—	501	—	—
United States .....	—	—	—	—	—	—	—	—	—	—
Poland .....	2,685	—	—	—	—	—	—	—	—	255
Switzerland .....	—	—	—	—	—	—	—	—	—	3,150
Union of South Afr. ....	992	—	596	200	—	—	—	—	—	—
Bolivia .....	12	—	—	—	—	—	—	—	—	—
Total <sup>1</sup> .....	217,916	248,602	255,418	217,335	181,303	275,778	371,652	394,262	379,182	291,081

<sup>1</sup>Total may not add due to rounding kilograms to metric tons.

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TABLE 28--- ARGENTINE LINSEED CAKE AND MEAL EXPORTS BY COUNTRY OF DESTINATION

[In metric tons]

Destination	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
Germany, West .....	65,928	74,769	73,051	60,179	69,520	105,383	47,997	40,647	33,127	29,355
Barbados .....	—	—	—	—	—	—	—	1,826	2,143	1,562
Belgium .....	44,004	38,471	45,407	46,200	61,100	51,085	18,908	58,754	34,567	23,378
Denmark .....	2,705	2,429	3,027	7,728	13,605	8,700	1,226	—	—	352
Spain .....	—	119	—	1,371	198	1,091	50	695	951	347
Finland .....	—	—	993	1,894	2,298	1,100	—	—	—	400
France .....	43,057	49,578	75,631	69,522	89,099	65,793	31,902	37,242	31,746	41,300
Greece .....	—	—	—	—	—	101	—	—	—	500
Hungary .....	—	—	—	—	—	999	—	—	2,301	1,500
Ireland .....	9,744	9,827	11,653	12,828	11,022	10,443	6,488	9,898	4,688	—
Canary Islands .....	—	—	—	50	348	50	—	363	105	393
Italy .....	38,109	24,101	26,646	31,196	19,678	29,891	14,491	18,506	13,740	28,016
Mexico .....	—	—	—	—	—	104	—	—	—	—
Norway .....	5,107	6,650	6,340	10,650	10,278	13,109	10,140	6,100	301	—
Netherlands .....	160,518	162,801	243,427	231,359	194,296	259,776	175,022	187,694	148,909	143,737
Poland .....	3,269	—	—	992	—	—	—	1,497	—	—
British Possessions .....	3,303	3,609	3,007	2,705	4,122	1,779	978	—	—	—
United Kingdom .....	13,744	3,667	18,192	6,792	3,198	1,828	2,649	648	630	606
Sweden .....	1,415	431	1,435	1,501	1,995	2,144	480	99	1,030	—
Switzerland .....	149	198	1,511	2,278	1,492	1,849	95	500	—	—
Trinidad and Tobago .....	—	—	—	—	27	92	77	299	225	58
U.S.S.R. ....	—	—	—	—	—	—	3,607	—	—	—
Yugoslavia .....	298	—	—	159	286	—	—	—	—	—
Union of South Afr. ....	—	—	—	—	—	—	—	—	—	3
Austria .....	3,843	3,247	1,594	3,041	—	—	—	—	—	—
Spanish Possessions .....	—	—	81	—	—	—	—	—	—	—
Japan .....	—	4,008	—	—	—	—	—	—	—	—
Total <sup>1</sup> .....	395,193	383,906	511,995	490,445	482,562	555,317	314,110	344,768	274,463	271,487

<sup>1</sup>Total may not add due to rounding kilograms to metric tons.

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TABLE 29 --- ARGENTINE PEANUT CAKE AND MEAL EXPORTS BY COUNTRY OF DESTINATION<sup>1</sup>

[In metric tons]

Destination	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
Germany, West .....	15,498	37,470	37,637	33,985	34,078	51,083	92,830	51,267	42,533	15,990
Austria .....	5,546	1,418	1,306	2,495	994	1,800	-	-	-	-
Bulgaria .....	-	-	-	-	-	-	2,000	-	-	-
Belgium .....	6,265	3,976	19,205	5,507	6,183	7,195	14,695	16,759	10,917	5,022
Chile .....	50	-	49	29	86	94	89	51	-	99
Denmark .....	3,670	10,833	6,139	13,847	18,577	12,481	1,325	-	-	-
Spain .....	-	-	-	428	-	-	11	-	-	-
Finland .....	-	-	4,842	2,069	-	2,000	-	-	-	-
France .....	545	2,722	13,407	3,046	848	8,217	1,445	1,999	497	1,000
Greece .....	-	-	-	-	-	412	670	-	-	-
Hungary .....	-	5,557	3,911	7,334	1,744	-	-	-	3,064	-
Ireland .....	5,887	7,014	10,935	2,834	1,877	1,191	991	879	-	-
Canary Islands .....	-	-	-	496	-	-	-	-	-	19
Italy .....	5,011	2,607	1,275	198	-	-	-	-	1	-
Japan .....	-	992	-	-	-	1,260	473	-	-	-
Norway .....	699	-	1,463	3,934	-	2,043	6,408	950	5,496	497
Netherlands .....	23,413	29,065	45,598	28,520	34,200	31,859	57,617	44,417	39,138	22,702
French Possessions .....	-	-	-	-	-	47	-	105	351	-
United Kingdom .....	23,013	1,286	11,298	919	1,789	198	917	-	-	696
Sweden .....	3,515	4,565	1,995	5,418	9,300	11,142	500	477	1,000	-
Switzerland .....	198	-	492	200	-	720	200	-	-	-
U.S.S.R. ....	-	-	-	-	-	-	500	-	-	-
Yugoslavia .....	-	-	198	504	1,340	-	-	-	-	-
Poland .....	1,980	-	-	2,983	-	-	-	-	-	-
Total <sup>1</sup> .....	95,291	107,506	159,750	114,766	121,757	131,742	180,671	116,904	102,997	46,026

<sup>1</sup> Total may not add due to rounding kilograms to metric tons.

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TABLE 30.— ARGENTINE COTTONSEED CAKE AND MEAL EXPORTS BY COUNTRY OF DESTINATION  
[In metric tons]

Destination	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
Germany, West.....	11,349	6,623	16,484	18,837	23,067	14,017	22,532	17,358	13,150	25,458
Belgium.....	5,477	2,795	5,818	1,078	3,698	10,782	2,169	4,886	1,357	911
Czechoslovakia.....	—	—	—	—	—	—	—	5,661	—	—
Denmark.....	9,915	19,689	11,235	18,598	14,270	1,748	2,795	3,022	—	2,214
Finland.....	—	1,000	—	—	—	7,997	—	—	—	—
France.....	1,091	991	1,187	552	4,308	3,978	146	1,030	1,395	250
Hungary.....	—	—	—	—	2,788	1,487	—	—	—	—
Ireland.....	1,857	4,393	3,528	1,719	993	1,451	1,196	3,157	922	—
Norway.....	—	—	496	—	7,232	7,959	2,667	10,414	5,173	—
Netherlands.....	12,134	8,618	28,944	4,335	17,643	20,813	32,503	25,434	14,852	37,700
Poland.....	—	—	—	—	—	12,389	8,041	2,002	—	—
French Possessions.....	—	—	—	—	—	—	—	—	25	—
United Kingdom.....	24,334	16,844	18,034	11,093	3,236	2,503	101	—	3,301	12,061
Sweden.....	2,134	1,633	2,309	3,541	1,413	2,303	1,433	—	1,360	—
Switzerland.....	—	—	—	198	—	852	—	—	—	—
U.S.S.R.....	—	—	—	—	—	—	595	—	—	—
Spain.....	—	—	—	—	—	—	—	—	—	208
Japan.....	—	992	—	992	—	—	—	—	—	—
Total <sup>1</sup> .....	65,290	63,579	88,035	60,943	78,648	88,279	74,178	72,964	41,535	78,802

<sup>1</sup> Total may not add due to rounding kilograms to metric tons.

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TABLE 31--ARGENTINE CAKE AND MEAL<sup>1</sup> EXPORTS BY MAJOR GEOGRAPHIC AREA AND COUNTRY OF DESTINATION, 1960-69  
[In metric tons]

Item	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
<b>EUROPE</b>										
<b>Western Europe:</b>										
<b>European Community:</b>										
West Germany .....	124,865	158,082	166,703	146,709	150,568	190,327	219,620	171,595	153,814	105,930
Italy .....	43,120	27,281	27,921	31,394	19,678	29,941	14,590	19,104	13,741	28,016
Netherlands .....	256,180	297,824	417,172	354,096	313,220	435,785	437,466	433,101	362,353	341,296
Belgium .....	61,668	59,705	84,248	68,294	89,239	103,610	69,862	118,030	109,563	57,353
France .....	46,788	56,474	96,677	85,484	100,942	88,436	36,121	42,258	35,327	43,052
Total EC .....	532,621	599,366	792,721	683,977	673,647	848,099	777,669	782,888	614,798	576,658
Austria .....	9,389	4,663	2,981	5,536	994	1,800	—	3,022	1,240	3,146
Denmark .....	25,986	35,480	23,652	49,009	56,119	37,837	6,698	6,628	13,116	21,696
Spain .....	—	119	1,239	1,685	2,298	11,097	—	495	—	400
Finland .....	—	1,000	5,835	3,963	2,298	11,097	—	495	—	400
Canary Islands .....	—	—	—	546	348	50	99	363	105	412
Ireland .....	18,672	26,536	29,287	19,935	15,572	19,648	14,393	17,847	8,619	501
Greece .....	—	—	—	—	—	513	670	—	—	500
Norway .....	5,806	6,650	8,328	14,584	28,837	23,111	19,215	17,464	10,970	2,492
United Kingdom .....	160,068	103,108	135,114	68,499	57,358	63,480	87,216	82,048	74,188	68,621
Sweden .....	8,210	7,643	5,985	10,510	12,708	19,280	3,404	576	3,390	—
Switzerland .....	347	198	2,599	2,876	1,492	3,421	295	500	—	—
Total Western Europe .....	761,099	784,767	1,007,746	863,432	851,058	1,031,615	916,317	915,331	786,326	674,416
<b>Eastern Europe and USSR:</b>										
Czechoslovakia .....	—	—	—	—	—	—	—	5,661	1,017	2,698
Bulgaria .....	—	—	—	—	—	—	—	—	—	—
Hungary .....	7,934	9,223	4,198	3,228	7,531	3,487	1,728	500	6,155	4,512
Poland .....	—	—	—	3,975	—	12,589	8,041	3,499	—	3,150
USSR .....	—	—	—	—	—	—	10,408	—	—	—
Yugoslavia .....	298	—	198	4,128	1,626	—	—	501	—	—
Total Eastern Europe .....	8,232	9,223	4,396	16,331	8,957	15,876	22,177	10,161	7,172	10,360
Total Europe .....	769,331	793,990	1,012,142	879,763	860,015	1,047,491	938,994	923,692	793,598	682,989
<b>AFRICA</b>										
French Possessions .....	—	—	—	—	—	97	—	105	376	—
Union of South Africa .....	992	—	—	—	—	—	—	—	—	—
Total .....	992	—	—	—	—	97	—	105	376	—
<b>ASIA</b>										
Japan .....	—	5,992	—	992	—	1,260	473	—	—	—
Total Asia .....	—	5,992	—	992	—	1,260	473	—	—	—
<b>AMERICAS</b>										
Barbados .....	—	—	—	—	—	—	—	1,826	2,143	1,562
Bolivia .....	12	—	—	—	—	—	—	—	—	—
Chile .....	50	—	49	29	86	94	89	2,976	—	99
Peru .....	—	—	—	—	—	—	—	—	1,614	642
Mexico .....	—	—	—	—	—	104	—	—	—	—
British Possessions .....	3,303	3,609	3,007	2,705	4,122	1,779	978	—	—	—
Spanish Possessions .....	—	—	81	—	—	—	—	—	—	—
Trinidad-Tobago .....	—	—	—	—	—	92	77	299	225	58
Uruguay .....	—	—	—	—	27	199	—	—	221	—
United States .....	—	—	—	—	—	—	—	—	—	255
Total Americas .....	3,365	3,609	3,137	2,734	4,235	2,268	1,144	5,101	4,203	2,816
Total meal exports <sup>2</sup> .....	773,688	803,591	1,015,199	885,489	864,250	1,051,119	940,611	928,898	798,177	687,395

<sup>1</sup> Includes sunflowerseed, peanut, cottonseed, and linseed cakes, meals, expellers, and pellets.

<sup>2</sup> Total may not add due to rounding kilograms to metric tons.

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excellent weather at planting in the 1970-71 period contributed to increased Argentine production and crush.

As in other oilcakes, 1969 data indicate 30 percent of production of peanut cake and meal was being used domestically. Until 1968, essentially all Argentine peanut cake and meal production was exported. As production of peanuts and peanut cake in 1971 increased more rapidly than domestic requirements, and export prices remained attractive, exported probably rose, both absolutely and relatively. In the longer run, however, domestic requirements for peanut cake are expected to increase somewhat, and the portion of total production available for exports is again expected to diminish.

From export data, we again note the type of cake and meal produced in Argentina by type of processing. About 75 percent of peanut protein marketed is in the form of expellers, the remaining 25 percent consisting of pellets. Until the early 1960's, peanut meal was the most important component, but by the mid-1960's, meal was converted to pellets for export. Pellet production, based on export data, appears to average about 25,000 tons. It is possible, however, that meal production being retained for domestic use is not being converted to pellets.

Exports of peanut expellers increased slightly in 1970 to approximately 44,000 tons. In 1969, exports fell to 46,026 tons, the lowest level in the last decade, as a result of decreased production. In 1971, exports of peanut expellers probably increased to about 100,000 tons. In the 1965-69 period, peanut expeller/pellet exports averaged 116,000 tons. However, longer term prospects for peanut expeller exports indicate a decline.

West Germany and the Netherlands are the chief markets. Exports to the Netherlands ranged between a low of 22,702 in 1969 to a high of 57,617 in 1966. Exports to West Germany during 1960-69 reached a peak of 92,830 tons in 1966 but have declined steadily since. Belgium also is a significant destination of Argentine peanut expellers.

## Cottonseed

Cottonseed cake production rose from 83,700 tons in 1969 to 115,000 in 1970. Argentine production was fairly constant during the 1950-70 period, averaging about 75,000 tons annually. Cottonseed oil and cake are byproducts of cotton production, and any future increases or decreases will result from changes in the outlook for cotton.

In recent years, most cottonseed cake and meal has been converted to pellets, and the remainder exported as expellers. In the early 1960's, Argentinian produced and exported large quantities of cottonseed cake, meal, and expellers. Since 1968, however, production and export of cottonseed cake and meal appears to have virtually ceased, as pellet production, which began in 1964, has risen. The economy of exporting pellets and expellers tends to dictate in favor of continued production of these categories. The meal and cake produced is likely to be earmarked for the domestic mixed feed industry.

Exports of Argentine cottonseed pellets and expellers in 1970 were just around 89,000 tons, or slightly above the 78,802 tons exported in 1969 and just above the last decade's high of 88,000 recorded in 1962 and 1965 (Table 30). Exports of cottonseed pellets or expellers will probably continue to decline moderately in the 1970-75 period.

The Netherlands and West Germany remain the primary export outlets for Argentine cottonseed pellets and expellers. These two destinations accounted for over 63,200 tons, or 75 percent of total Argentine exports in 1968 and 1969. The United Kingdom, Norway, and Belgium have also been important outlets.

## Export Areas

The commercial markets of Western Europe are by far the major destinations for Argentine cake and meal exports. About 85 percent of the exports go to the European Community countries and 14 percent to other Western Europe. Eastern Europe has been a small market, taking about 1 percent, or less than 20,000 tons (Table 31).

## THE MIXED FEED INDUSTRY

Argentine production of mixed feed rose nearly 25 percent in 1970 to a record of nearly 1 million tons from the 800,000 tons produced in 1969. These data are reported by the mixed feed association, whose members account for 90 percent of the total mixed feed production (Table 32). The rapid growth in Argentine mixed feed production is expected to continue with increasing domestic requirements (for domestically produced meals.) The development of the broiler industry is the major stimulus behind the expansion.

Until 1967, essentially the entire Argentine production of vegetable oilcake and meal was exported. In 1967 and 1968, the mixed feed industry appears to have consumed an average of 44,000 tons of domestically produced oilcake and meal, which, by weight, was about 8 percent of mixed feed production.

By 1969, however, the domestic mixed feed industry's consumption of oilcakes rose to an estimated 150,000 tons (including 10,000 tons of domestic and imported soybean meal), or 20 percent of the mixed feed production. This amounted to 28 percent of oilcake and meal output that appears utilizable in poultry feed production. This calculation does not include linseed meal, which is not fed to poultry. Linseed meal, however, generally accounts for over a third of total meal production.

Preliminary figures for 1970 indicate oilcake and meal consumption was about the same as in 1969. In 1971, some further increase in domestic use of oilcake and meals probably occurred particularly for peanut meal.

Argentina appears destined to play a diminishing role as an exporter of oilcake and meals in the 1970-75 period, as requirements of the mixed feed industry may rise more rapidly than domestic production of oilcakes and meals. However, production of soybeans is expected to increase sharply from its relatively low level of 60,000 tons. The Argentine Government is promoting increased production of this crop and this past year raised the support price substantially.

A jump in mixed feed production from 1 million tons to 1.8 million is projected for the 1970-1975 period (Table 33). This projection is based upon the rate of increase since 1967 and will be almost entirely

due to poultry industry increases. If protein meal use continues to account for 20 percent of the mixed feed tonnage, some 360,000 metric tons will be consumed. This is well over half of the present production of utilizable oilcake, which includes sunflowerseed, cottonseed, and peanut meal. This is quite significant in that up until 1967, Argentina exported almost 100 percent of its oilcake and meal production.

Based on the feed association data, the distribution of mixed feeds is about as follows: Poultry, 96 percent; swine, 2 percent; and cattle, 2 percent. Of the 96 percent used in poultry, 60 percent is for broilers and 40 percent for layers, mostly replacement stock.

Sunflower pellets, meat meal, and some soybean meal are the primary proteins used in poultry rations. There has been some use of relatively high protein content fishmeal, generally 2 to 3 percent. However, the results of fishmeal use have been favorable. When available, soybean meal may constitute up to 25 percent of the high protein portion of the broiler ration, meat meal 30 percent, and sunflower, peanut, cottonseed, or blood meal, the remaining 45 percent (Table 33).

The Argentine mixed feed industry, generally, does not add fats to feeds. In 1969, price relationships were favorable, and tallow with antioxidants was added to broiler rations as a high energy source. By mid-1970, tallow prices rose and it no longer became profitable to add tallow to feeds. This was because corn prices were relatively attractive and displaced tallow again in feeds.

The Argentine Government in an effort to increase the amount of beef available for export has embarked on a policy of cutting domestic beef consumption. A program whereby every other week is a "no beef" week has been implemented. The goal is to reduce the per capita consumption of beef from 90 kilograms to 50.

During the "no beef" week, other commodities, such as poultry, pork, and fish, are likely to be substituted for beef. The main increases are expected to take place in the poultry industry because of the shortness of the growing cycle and the advantageous feed conversion ratios. The aim is to increase broiler consumption from 7 kilograms to 17, and eggs from

TABLE 32.-- MIXED FEED PRODUCTION IN ARGENTINA  
[in metric tons]

Year and quarter	Broiler	Poultry, reproducing and breeding	Layer	Total poultry	Cattle	Hogs	Other livestock	Total
<b>1965:</b>								
First .....	51,250	24,470	25,450	101,170	1,570	1,280	2,890	106,910
Second .....	51,110	20,580	30,210	101,900	3,560	2,060	3,150	110,670
Third .....	79,180	22,060	39,380	131,560	2,860	2,340	3,970	140,730
Fourth .....	91,820	28,490	35,120	155,430	2,120	2,110	3,600	163,260
Total .....	264,360	95,540	130,160	490,060	10,110	7,790	13,610	521,570
<b>1966:</b>								
First .....	66,260	18,450	29,820	113,740	1,190	1,450	2,150	118,490
Second .....	60,990	12,780	29,340	102,910	2,240	1,050	2,130	108,230
Third .....	76,240	12,590	29,550	118,390	2,990	420	2,230	123,930
Fourth .....	73,560	18,840	24,440	116,840	1,350	700	1,730	120,620
Total .....	276,150	62,660	112,950	451,680	7,770	3,600	8,220	471,370
<b>1967:</b>								
First .....	50,510	15,530	23,250	87,300	1,110	550	1,630	90,590
Second .....	69,680	10,440	25,110	105,230	2,340	620	1,830	110,020
Third .....	80,370	10,450	29,780	120,600	3,200	650	1,740	126,170
Fourth .....	88,150	18,930	31,080	138,160	1,020	1,350	1,130	141,640
Total .....	288,710	53,350	109,230	451,290	7,670	3,150	6,330	468,420
<b>1968:</b>								
First .....	81,850	50,215	20,727	132,790	1,250	1,360	1,420	136,530
Second .....	84,710	27,880	29,600	142,190	2,690	1,290	1,830	148,000
Third .....	97,530	30,910	33,960	162,400	2,490	1,690	1,950	168,500
Fourth .....	122,150	39,280	33,320	194,670	1,070	1,590	1,850	199,180
Total .....	385,970	128,203	117,607	631,780	7,490	5,930	7,030	652,230
<b>1969:</b>								
First .....	102,510	34,400	34,630	171,540	1,030	1,510	1,680	175,760
Second .....	102,380	32,830	37,820	173,030	1,780	2,070	1,700	178,580
Third .....	122,650	38,060	42,830	203,540	1,600	2,270	2,430	209,840
Fourth .....	142,230	48,000	42,590	232,820	920	2,750	2,250	238,740
Total .....	469,770	153,290	157,870	780,930	5,330	8,600	8,060	802,910
<b>1970:</b>								
First .....	121,240	40,140	42,210	203,590	960	1,760	2,220	208,530
Second .....	124,512	37,297	42,420	204,229	1,380	2,040	2,760	210,409
Third .....	156,710	44,630	47,660	249,000	2,140	2,200	2,510	255,850
Fourth .....	193,350	58,440	44,820	296,610	1,390	2,590	2,530	303,140
Total .....	595,812	180,507	177,110	953,429	5,870	8,590	10,040	977,929
<b>1971, first .....</b>	166,640	50,636	45,220	262,496	1,130	2,223	2,363	268,212

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130 to 200 per capita per year. This, in turn, will require substantial increases in mixed feed production and the usage of protein oilcakes and meals.

In addition, the increased demand for poultry will put upward pressure on its price. To prevent price increases, the government has established a maximum ceiling on retail prices, and farm prices. The trade reports, however, that the retail ceiling has created some illegal marketing. Growers will sell to buyers who are not inspected by the government. They, in turn, will sell to consumers at higher prices.

The trade expects increases to be permitted in the present ceiling prices in order to encourage more

orderly marketing.

Another problem facing the poultry industry is the consumer demand for big birds. The birds are grown to about 4.5 pounds in a 70-day cycle and are about the same size as farm chickens. Not only is this a longer cycle, but there is also a loss in feed conversion, which averages 2.5 to 2.6 pounds of feed per pound of meat produced. A 2.0 to 2.2 conversion ratio is possible with lighter birds. However, the cost of baby chicks is high and may be a problem in the production of lighter birds. There is little economic incentive at the present time to develop a market for these birds.

TABLE 33--- ARGENTINE MIXED POULTRY FEED PRODUCTION, PROJECTED THROUGH 1975  
[In metric tons]

Year	Quarter				Total
	First	Second	Third	Fourth	
1971 .....	262,496	272,821	294,786	316,750	1,146,853
1972 .....	293,700	315,664	337,629	359,593	1,306,586
1973 .....	336,543	358,507	380,471	402,436	1,477,957
1974 .....	379,386	401,350	423,314	445,279	1,649,329
1975 .....	422,229	444,193	466,157	488,121	1,820,700



## THE EXPORT SECTOR

The agricultural sector supplies nearly 90 percent of total Argentine export trade, making foreign reserves and capital imports dependent on agricultural production. Oil and meal exports are an important component of this export trade, though they do not generate as much foreign exchange as the major exports — grain and livestock products. These three items generated a total export earning of \$1,262 million in 1970, of which \$142 million was vegetable oils and byproducts. Total earnings from agricultural exports was \$1,773 million.

While there is a large domestic, as well as export, market for edible oils, almost all nonedible oil and cake and meal go into export, with little consumed at home. However, cake and meal have recently found an increasing use in the domestic mixed feed industry.

Government regulations restrict the export of oilseeds in order to provide an adequate supply of raw material to the domestic crushing industry. Exports of sunflowerseed and peanuts (except for confectionery uses) are prohibited by government decree. Flaxseed may be exported, but restricted by prohibitively high export taxes.

Soybeans are not covered by a decree or export tax. However, should production increase significantly, a decree or export tax would probably be forthcoming. The current tax system limits exports to oilseed byproducts, oils, and cakes and meals.

### Exports of Oil Versus Domestic Consumption

Basically, the domestic demand for edible oil is satisfied first at given price levels, and the surplus is exported. This maintenance of domestic consumption is reflected in the wide variation in oil exports due to variations in oilseed production. World prices have an effect on internal prices even after allowance for export taxes.

With the establishment of a viable crushing industry in the early forties and the advent of World War II with resultant oil shortages in the world, Argentina exported 36 percent of its edible oil production during the 1941-45 period. This decreased to 12.5 percent in 1951-55, when oilseed production was low (Table 47). Since then, exports have increased to where they currently draw off over a quarter of total

production. This is quite a large segment of total demand and creates an external effect on domestic prices.

The interaction of foreign and domestic demand can be viewed through a comparison between Argentine prices of sunflowerseed oil at Buenos Aires and world prices quoted at Rotterdam, and their effect on changes in per capita consumption of edible oils, (sunflower oil is the major component of domestic consumption).

During the last 10 years, whenever world prices exceeded domestic prices, there was a drop in per capita consumption from the previous year's level, except in 1965 when supplies were sufficient to satisfy a relatively high export level as well as the increased consumer demand arising from a substantial increase in per capita income (Table 35).

Likewise, when domestic prices were above world prices, there was an increase in per capita consumption from the preceding year's level, with the exception of 1969 when there was a substantial decrease in oil production from the previous year's level and only small exports.

In 1970, the foreign demand was so great vis-a-vis domestic demand that an export quota was imposed on sunflower oil exports to maintain domestic consumption and adequate stock levels. Exports of sunflower oil were stopped in 1971 due to short supplies.

In the last decade, supplies of edible oil have grown sufficiently to meet an increasing domestic demand as well as to allow an increasing percentage of production for export. With sunflowerseed becoming a major component of the world edible oil market in the last decade, there has been an increased external demand for Argentine exportable supplies. With the decrease in supplies of sunflower oil from the USSR in recent years, the foreign demand for Argentine oil is exerting more pressure on total demand for edible oil, necessitating increased government control to regulate supplies (and prices).

### Volume of Oil and Meal Exports

Exports of vegetable oils, including edible and inedible, have averaged around 50 percent of total oil production since the end of World War II. After World War II, exports of oilseeds dropped to negligi-

ble amounts due to increased domestic crushing capacity and government regulation of exports. The exports involved about one quarter of total edible oil production and almost all of inedible oil production.

Edible oil exports were over 73,000 tons in the World War II period, constituting 36 percent of total production. Exports then declined to an average of 25,000 tons (12 percent of production) in 1951-55, a

TABLE 34.—ARGENTINE OIL AND OILCAKE PRODUCTION AND EXPORTS

Year	Edible oil			Inedible oil		
	Production	Exports		Production	Exports	
		Quantity	Share of production		Quantity	Share of production
	<i>Metric tons</i>	<i>Metric tons</i>	<i>Percent</i>	<i>Metric tons</i>	<i>Metric tons</i>	<i>Percent</i>
Average:						
1936-40 .....	84,041	346	0.4	7,135	1,487	20.8
1941-45 .....	201,687	73,253	36.3	161,937	29,999	18.5
1946-50 .....	256,838	71,195	27.7	197,101	140,885	71.5
1951-55 .....	204,741	25,649	12.5	145,830	170,371	116.8
1956-60 .....	270,276	51,836	19.2	167,876	155,626	92.7
1961-65 .....	296,107	72,188	24.4	225,716	240,930	106.7
1966-69 .....	421,677	114,665	27.2	171,089	169,961	99.3
Annual:						
1960 .....	295,283	79,659	26.9	204,639	188,316	92.0
1961 .....	267,913	66,333	24.8	167,737	220,739	131.6
1962 .....	334,928	130,121	38.9	250,387	280,513	112.0
1963 .....	281,845	50,641	18.0	248,501	228,902	92.1
1964 .....	219,606	10,402	4.7	230,961	223,798	96.9
1965 .....	376,242	103,242	27.4	239,069	250,694	104.9
1966 .....	426,459	166,291	39.0	168,844	136,191	80.7
1967 .....	470,500	157,102	33.4	178,650	236,638	132.5
1968 .....	414,609	153,200	37.0	150,258	116,643	77.6
1969 .....	375,135	62,745	16.7	186,608	190,372	102.0
1970 .....	478,200	147,900	30.9	245,400	182,600	74.4
	Total oil			Oilcake <sup>1</sup>		
Average:						
1936-40 .....	91,176	1,833	2.0	(2)	143,743	-
1941-45 .....	363,624	103,232	28.4	(2)	173,937	-
1946-50 .....	453,939	212,080	46.7	762,112	718,900	94.3
1951-55 .....	350,571	196,020	55.9	580,382	491,007	84.6
1956-60 .....	438,152	207,462	47.3	690,896	712,035	103.1
1961-65 .....	521,823	313,118	60.0	895,194	936,513	104.6
1966-69 .....	592,766	284,626	48.0	889,499	839,243	94.4
Annual:						
1960 .....	499,927	267,975	53.6	762,300	776,364	102
1961 .....	435,650	287,072	65.9	715,736	806,917	113
1962 .....	585,315	410,639	70.2	940,899	1,016,986	108
1963 .....	530,346	279,543	52.7	925,631	936,367	96
1964 .....	450,567	234,200	52.0	812,956	867,989	107
1965 .....	615,311	353,936	57.5	1,080,757	1,054,309	98
1966 .....	595,303	302,482	50.8	901,079	941,778	105
1967 .....	649,150	393,740	60.7	965,583	928,898	96
1968 .....	564,867	269,843	47.8	833,875	798,177	95.7
1969 .....	561,743	253,117	45.1	877,045	688,119	78.5
1970 .....	726,600	330,500	45.5	(2)	(2)	(2)

<sup>1</sup> Percentages do not reflect changes in stock levels.

<sup>2</sup> Not Available.

TABLE 35--SUNFLOWERSEED OIL: IMPACT OF PRICE LEVELS ON ARGENTINE EXPORT AVAILABILITIES

Calendar year	Price		Price index		Price <sup>1</sup> pressure <sup>2</sup>	Per capita oil consumption	Sun oil exports
	Argentina (Buenos Aires)	Rotterdam (any origin)	Argentina	Rotterdam			
	Dol. per metric ton	Dol. per metric ton	(Base 1960-61 = 100)				
1960	247.88	242.0	90	88	Domestic	9.4	13,608
1961	302.34	311.0	110	112	Foreign	9.3	30,989
1962	187.25	244.0	68	88	Domestic	9.2	14,897
1963	285.89	235.3	104	85	Domestic	9.8	4,352
1964	360.77	254.7	131	92	Domestic	10.1	31
1965	246.95	290.7	90	105	Foreign	11.7	35,478
1966	219.85	261.0	80	94	Domestic	11.6	77,998
1967	161.54	211.7	59	77	Domestic	11.5	81,085
1968	180.57	170.1	66	62	Domestic	12.0	80,020
1969	245.89	212.2	89	77	Domestic	11.6	7,340
1970	272.70	331.8	99	120	Foreign	12.6	101,160

time when oilseed production was particularly depressed because of low prices. Since then, vegetable oil exports on an absolute level, and as a percentage of total production, have been increasing and averaged over 100,000 tons in 1966-69.

The composition of total exports varied considerably over the period. In 1941-45, sunflower oil constituted over 60 percent of total edible oil exports, and cottonseed oil, under 20 percent (Table 36). This dominance of exports by sun oil decreased during the fifties and early sixties to under 25 percent of edible oil exports in the 1961-65 period. Peanut oil exports, on the other hand, increased to over 45,000 tons, constituting over 60 percent of edible oil exports. By the final half of the sixties, with the resurgence in sunflowerseed production, sunflower oil returned to its dominant position in the export market, again constituting over 50 percent of the edible oil exports, with peanut oil contributing 35 percent.

The export market, however, does not reflect the full importance of sunflower oil in the Argentine edible oil situation, as this product generally supplies about 90 percent of domestic oil requirements. Peanut oil normally goes into the export market and is a residual supplier in the domestic market when sunflower oil production falls below domestic demand for edible oils. This is a result of the higher price of peanut oil in the world markets vis-a-vis sunflower oil and the acquired taste for sun oil in the domestic market.

Inedible oil exports, which include linseed and tung oil, increased from the World War II level of 30,000 tons to 240,000 in the early sixties. The latter half of the sixties saw a decrease to 170,000 tons as world linseed oil markets tightened in response to falling world demand and a surplus stocks building up in other major exporting countries—mainly the United States and Canada. Almost all of inedible oil production goes into exports, the major market being the EC, which imports about three-quarters of Argentine exports of linseed oil (Table 37).

Argentine livestock are primarily raised on pasture and forage crops, resulting in little internal demand for high-protein feedstuffs.

### Major Markets

Argentine sunflowerseed oil is a major competitor with U.S. soybeans and soybean oil in the export market.

Argentine sunflowerseed oil, a relatively high-quality oil, enjoys a good market in Western Europe where it competes with the USSR and Eastern European supplies. Argentina, up to 1965, shipped most of its edible oil surpluses to this market, but with the high increases in sunflowerseed and oil exports out of

the USSR into Western Europe and the institution of LAFTA preferential trade agreements in 1960, Argentina began exporting more sunflowerseed oil into LAFTA countries. (Table 38). By 1968, Argentina exported as much to LAFTA countries as to Western Europe. These exports displaced U.S. soybean and cottonseed oil exports to LAFTA countries to the point where Argentina in 1968 surpassed the United States as the major edible oil supplier in LAFTA markets.

In 1969, however, Argentina's exports of its major edible oils dropped by more than half the previous 3-year level of over 150,000 tons because of decreased production of sunflower oil. As a result, the U.S. regained its leading role in supplying the LAFTA countries. However, it still appears that the United States is becoming more of a residual commercial supplier to this market.

The importance of the LAFTA countries as export markets for Argentine edible oils cannot be overstated, especially in view of the fact that they imported over \$55 million of edible vegetable oils in 1968. Imports of Argentine oil by these countries increased from 65,000 metric tons in 1963 to over 200,000 in 1969. The top purchases were Peru, Chile, and Brazil. However, Brazil is becoming a major oilseed producer in its own right and is no longer a market for edible oil. One handicap to Argentine trade in edible oils is its reputation as an irregular supplier. Argentina has not been able to maintain its share of foreign markets because of production difficulties and thus variable export availabilities. Stocks are kept quite low due to the lack of storage facilities, which limits the flexibility of export supplies. Nonetheless, the potential remains for further inroads into the LAFTA market by Argentine edible oil exports.

Argentine exports of peanut, (Table 39) cottonseed, and olive oils are mainly destined for the EC countries of Western Europe. Prior to 1967, tung oil had been exported primarily to the United States. However, during this period, the CCC accumulated substantial stocks of tung oil. When the CCC began selling its stocks Argentine tung oil exports shifted to Western Europe (Table 40).

### Export Taxes

Since quite a large percentage of agricultural products are exported, the foreign market is a major determinant of domestic prices. Trade policy in Argentina attempts to control the flow of exports and indirectly influence production by regulating export earnings. This is achieved through the maintenance of an export tax, which established a margin between the export price and the domestic price. Export taxes are also a major source of governmental revenue, and conflict has arisen often over interests that would maintain high export taxes to generate revenue and

TABLE 36--ARGENTINE EXPORTS OF MAJOR VEGETABLE OILS BY TYPE

[In metric tons]

Year	Edible oil					Inedible oil			Total oil exports
	Sunflower oil	Peanut oil	Cottonseed oil	Rapeseed oil	Olive oil	Total edible oil	Linseed oil	Tung oil	Total inedible oil
1936 .....	-	4	25	-	-	29	36	-	36
1937 .....	-	3	-	-	-	3	49	-	49
1938 .....	-	2	-	-	-	2	92	-	92
1939 .....	-	135	2	-	-	137	1,472	-	1,472
1940 .....	-	386	1,171	-	-	1,557	5,784	-	5,784
Average ..	-	106	240	-	-	346	1,487	-	1,487
1941 .....	11,909	6,385	7,043	12,053	-	37,390	9,715	-	9,715
1942 .....	59,387	7,900	7,427	14,299	-	89,013	33,523	-	33,523
1943 .....	32,552	1,334	20,066	8,347	-	62,299	35,221	-	35,221
1944 .....	49,404	563	14,441	7,879	-	72,287	25,236	-	25,236
1945 .....	71,959	3,857	19,079	10,282	-	105,177	46,300	-	46,300
Average ..	45,042	4,008	13,611	10,572	-	73,233	29,999	-	29,999
1946 .....	58,840	10,940	9,950	5,696	-	85,436	148,277	1,858	150,135
1947 .....	58,840	5,123	6,849	4,784	-	75,596	213,459	14	213,473
1948 .....	48,738	1,253	7,234	3,523	-	60,748	46,443	2	46,445
1949 .....	13,526	3	4,200	25	-	17,754	69,151	10,437	79,588
1950 .....	102,978	-	12,180	1,513	-	116,671	205,867	8,915	214,782
Average ..	56,540	3,464	8,083	3,108	-	71,195	136,640	4,245	140,885
1951 .....	83,008	-	8,521	-	-	91,529	258,039	7,660	265,699
1952 .....	9,108	-	-	-	-	9,108	27,666	9,238	36,904
1953 .....	19,539	4,085	-	-	-	23,624	112,452	11,301	123,753
1954 .....	2,590	1,062	-	-	-	3,652	244,932	12,581	257,513
1955 .....	-	333	-	-	-	333	155,819	12,168	167,987
Average ..	22,849	1,096	1,704	-	-	25,649	159,782	10,589	170,371
1956 .....	4,817	286	-	-	-	5,103	61,021	16,306	77,327
1957 .....	11,765	34,908	-	1,385	7,539	55,597	140,697	16,355	157,052
1958 .....	42,631	54,992	5,636	306	2,604	106,193	161,846	21,091	182,937
1959 .....	4,014	3,724	2,092	-	2,792	12,622	217,485	15,970	233,455
1960 .....	13,608	50,646	3,970	-	11,435	79,659	168,959	19,357	188,316
Average ..	15,367	28,912	2,345	338	4,874	51,836	137,810	17,816	155,626
1961 .....	30,989	30,821	3,933	-	570	66,333	204,355	16,384	220,739
1962 .....	14,897	98,450	7,563	-	9,211	130,121	264,096	15,422	280,518
1963 .....	4,352	36,427	2,228	-	7,634	50,641	212,865	16,037	228,902
1964 .....	31	489	51	-	9,831	10,402	205,120	18,678	223,798
1965 .....	35,478	61,856	1,091	-	4,814	103,242	239,071	11,623	250,694
Average ..	17,149	45,609	3,018	-	6,412	72,188	225,101	15,829	240,930
1966 .....	77,998	79,217	1,425	-	7,651	166,291	121,457	14,734	136,191
1967 .....	81,085	62,365	4,868	-	8,784	157,102	211,254	25,384	236,638
1968 .....	80,020	61,461	6,470	-	5,249	153,200	98,189	18,454	116,643
1969 .....	7,340	39,001	2,920	-	13,481	62,745	166,768	23,604	190,372
1970 .....	101,160	42,567	1,000	-	3,449	148,176	168,409	14,078	182,487
Average ..	69,521	56,922	3,337	-	7,723	137,503	153,215	19,251	172,466
									309,969

TABLE 37.—ARGENTINE LINSEED OIL EXPORTS BY COUNTRY OF DESTINATION  
[In metric tons]

Destination	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
Germany, West .....	12,653	5,671	15,791	8,416	15,322	2,713	5,425	32,215	10,064	7,555
Australia .....	—	—	1,350	—	—	—	—	—	39	269
Belgium .....	—	—	—	—	2,855	1,570	—	1,933	—	—
Bolivia .....	—	—	3	—	13	—	1	13	65	45
Brazil .....	—	—	—	—	397	—	—	200	2,582	129
Columbia .....	—	—	214	676	528	521	1,236	512	1,321	1,056
Czechoslovakia .....	1,976	193	—	—	501	1,690	647	—	—	—
Chile .....	—	3	—	—	—	—	—	26	641	1,164
Denmark .....	1,255	—	—	—	—	—	347	—	—	—
Ecuador .....	—	—	—	—	—	2	—	—	—	—
Spain .....	—	—	4,418	4,006	3,639	3,967	250	—	—	375
Finland .....	—	—	—	—	—	—	—	—	—	—
France .....	4,873	12,710	10,776	5,580	8,001	3,921	2,800	4,510	6,006	7,709
Greece .....	—	—	—	—	—	—	—	—	700	—
Hungary .....	—	290	1,552	1,318	1,127	2,715	1,798	—	—	1,101
Israel .....	—	—	—	—	—	—	—	—	—	5
Italy .....	15,823	12,271	14,130	14,332	11,330	10,361	9,085	15,300	14,751	15,168
Japan .....	—	—	743	778	—	—	—	2,734	280	275
Liberia .....	—	—	—	—	—	—	—	—	—	1,300
Mexico .....	—	—	—	—	25	—	—	—	—	—
Norway .....	—	—	—	680	—	110	—	—	—	—
Netherlands .....	100,676	130,616	182,422	150,778	124,971	154,920	73,885	130,849	55,072	116,652
Paraguay .....	4	3	8	14	9	6	1	—	—	—
Peru .....	6	—	1	—	—	439	5	11	19	40
United Kingdom .....	14,638	13,795	19,623	8,494	8,192	7,377	2,937	2,190	—	3,125
Syria .....	—	—	—	—	—	—	—	—	31	—
Switzerland .....	780	428	543	149	732	87	122	—	—	105
Sweden .....	3,238	2,186	2,479	803	—	—	—	—	—	—
U.S.S.R. ....	5,894	20,500	—	10,000	21,336	43,643	20,000	9,500	—	—
Union of South Africa .....	2,700	1,654	4,270	2,297	4,155	3,054	2,918	3,767	2,939	1,227
Venezuela .....	11	145	—	—	—	—	—	—	42	—
Yugoslavia .....	1,582	1,919	1,291	1,703	1,797	1,775	—	7,494	3,617	9,368
Poland .....	2,750	1,909	4,482	2,542	—	—	—	—	—	—
British Possessions .....	—	—	—	199	—	—	—	—	—	—
Total 1 .....	168,959	204,355	264,095	212,865	205,120	239,071	121,457	211,254	98,189	166,768

1 May not add due to rounding.

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TABLE 38-- ARGENTINE SUNFLOWERSEED OIL EXPORTS BY COUNTRY OF DESTINATION  
[In metric tons]

Destination	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
Germany, West .....	1,057	3,376	1,405	200	-	4,837	5,248	2,745	788	-
Australia .....	-	-	-	-	-	-	-	-	50	-
Belgium .....	-	99	750	-	-	446	-	190	589	-
Bolivia .....	299	537	344	186	22	190	537	1,949	3,391	2,367
Brazil .....	-	-	-	-	-	-	238	-	13,938	1,020
Chile .....	1,437	47	18	90	1	-	375	17,818	6,876	523
Spain .....	-	-	-	-	-	-	-	382	-	-
United States .....	-	-	36	74	-	-	-	2	-	-
France .....	-	745	819	543	-	-	117	454	254	254
Guinea .....	-	-	-	-	-	-	251	-	-	-
Ireland .....	-	-	-	353	-	-	-	-	-	-
Italy .....	150	537	-	928	-	-	-	3,518	2,015	299
Iran .....	-	-	-	-	-	-	-	-	7,775	-
Norway .....	-	-	-	-	-	-	1,400	-	-	-
Netherlands .....	8,656	19,912	11,568	1,977	-	13,829	36,695	23,733	4,747	649
Panama .....	-	-	-	-	-	-	-	435	-	-
Paraguay .....	558	-	5	1	8	105	23	27	-	-
Peru .....	1,450	1,798	-	-	-	13,577	26,879	28,351	38,219	2,228
British Possessions, Africa ..	-	-	-	-	-	-	-	-	1,040	-
Portuguese Possessions, Africa ..	-	-	-	-	-	-	-	-	-	-
United Kingdom .....	-	-	-	-	-	-	345	1,483	-	-
Sweden .....	-	-	100	-	-	-	620	-	340	-
Switzerland .....	-	139	52	-	-	-	-	-	-	-
Union of South Africa .....	-	-	-	-	-	396	-	-	-	-
Uruguay .....	-	-	-	-	-	-	2,401	-	-	-
Morocco .....	-	3,800	-	-	-	2,099	2,870	-	-	-
Total <sup>2</sup> .....	13,608	30,989	14,897	4,352	31	35,478	77,998	81,085	80,020	7,340

<sup>1</sup> Negligible.

<sup>2</sup> May not add due to rounding kilograms to metric tons.

<sup>3</sup> Instituto Nacional de Estadística y Censos.

TABLE 39 -- ARGENTINE PEANUT OIL EXPORTS BY COUNTRY OF DESTINATION  
[ In metric tons ]

Destination	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
Germany, West . .	11,249	7,429	12,773	3,981	-	15,053	13,875	16,100	19,849	8,635
Algeria . . . . .	-	-	-	-	-	1,100	-	-	1,000	-
Australia . . . . .	-	-	509	-	-	-	295	350	207	-
Belgium . . . . .	2,169	815	865	814	-	1,380	2,033	584	1,000	-
Bolivia . . . . .	-	-	1	5	-	-	-	3	-	-
Czechoslovakia . .	141	-	-	-	-	-	-	-	-	-
Spain . . . . .	-	-	29,684	7,297	-	-	601	1,241	876	-
France . . . . .	809	-	727	454	-	-	447	-	639	-
Hungary . . . . .	-	-	-	-	-	-	-	-	669	-
Israel . . . . .	-	-	-	-	-	-	-	-	197	560
Canary Islands . . .	-	-	-	-	-	-	-	549	1,514	254
Italy . . . . .	100	-	286	438	-	-	-	1,299	-	-
Netherlands . . . .	35,367	22,509	51,383	23,438	485	36,706	61,643	41,672	29,967	29,096
Paraguay . . . . .	-	-	-	-	-	52	-	-	-	-
Peru . . . . .	-	-	-	-	-	-	-	-	5	20
British Possessions .	-	-	160	-	-	96	323	256	-	-
United Kingdom . .	-	-	813	-	-	469	-	-	1,700	-
Dominican Republic .	-	-	999	-	-	7,000	-	-	3,838	-
Sweden . . . . .	-	-	-	-	-	-	-	311	-	-
Switzerland . . . .	254	267	246	-	-	-	-	-	-	-
Yugoslavia . . . . .	-	-	-	-	-	-	-	-	-	436
Uruguay . . . . .	-	2	3	-	-	-	-	-	-	-
Morocco . . . . .	556	-	-	-	4	-	-	-	-	-
Total <sup>1</sup> . . . . .	50,646	30,821	98,450	36,427	489	61,856	79,217	62,365	61,461	39,001

<sup>1</sup> Total may not add due to rounding kilograms to metric tons.

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TABLE 40-- ARGENTINE TUNG OIL EXPORTS BY COUNTRY OF DESTINATION

[In metric tons]

Destination	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
Germany, West . . . .	1,429	1,321	3,071	2,970	2,404	740	1,131	181	1,522	1,815
Australia . . . . .	-	-	-	137	30	-	-	61	171	18
Austria . . . . .	-	-	-	-	-	-	-	-	-	115
Belgium . . . . .	-	-	-	-	-	-	-	347	240	-
Canada . . . . .	-	-	200	-	297	-	100	-	-	-
Colombia . . . . .	-	-	-	-	12	10	19	14	14	32
Czechoslovakia . . . .	-	-	199	-	-	-	-	299	-	-
Chile . . . . .	16	28	15	2	5	-	11	13	23	23
Spain . . . . .	-	-	20	-	15	-	-	299	947	85
United States . . . . .	9,503	10,464	7,815	4,333	8,262	6,150	6,338	3,768	1,543	2,720
Italy . . . . .	563	298	217	572	572	218	228	1,037	1,407	804
Japan . . . . .	-	375	-	832	859	216	101	1,237	1,046	191
Mexico . . . . .	6	-	-	82	149	123	178	225	222	234
Netherlands . . . . .	3,683	2,188	2,867	3,403	4,812	2,863	4,972	8,674	7,546	7,415
Peru . . . . .	-	2	-	-	-	1	-	3	5	6
Poland . . . . .	-	-	-	674	-	-	-	-	-	2,676
United Kingdom . . . .	3,843	1,599	1,977	3,017	1,086	659	1,598	3,583	3,450	3,672
Trinidad . . . . .	-	-	-	-	-	-	-	-	-	10
USSR . . . . .	-	-	-	-	-	600	-	5,605	16	3,001
Uruguay . . . . .	-	6	-	5	-	5	13	3	3	-
Venezuela . . . . .	-	-	-	10	73	38	45	35	-	15
Yugoslavia . . . . .	-	-	-	-	-	-	-	-	299	-
Bulgaria . . . . .	-	20	-	-	100	-	-	-	-	-
South Korea . . . . .	-	-	-	-	2	-	-	-	-	-
Sweden . . . . .	-	-	-	-	-	-	-	-	-	-
France . . . . .	315	84	41	-	-	-	-	-	-	-
Total <sup>1</sup> . . . . .	19,357	16,385	16,422	16,037	18,678	11,623	14,734	25,384	18,454	23,604

<sup>1</sup> Total may not add due to rounding kilograms to metric tons.

Instituto Nacional de Estadística y Censos.

those that desire lower taxes in order to increase returns to producers, increase production, and thereby generate higher exports and foreign exchange earnings.

The *export tax system* is basically two taxes—a specific purpose tax and a retention tax, which are defined as a percentage and computed on the basis of an index value rather than the ad valorem value.

The specific taxes on oil and meal exports have remained constant. When applied to grains, these taxes generate revenue for (1) construction of port elevators, (2) support of the National Grain Board, (3) support of agricultural research, (4) construction of highways, and (5) support of statistical services.

For oils (except linseed oil) and meals, a special-purpose tax is levied only for support of agricultural research carried out in the National Institute of Agricultural Technology. This tax amounts to 1.5 percent. For crude linseed oil, an additional 1.0 percent is levied for construction of highways and 0.3 percent for support of statistical services.

A *retention tax* serves as a means of adjusting foreign exchange earnings of exporters when the value of the peso is changed. The retention tax is raised after devaluation and progressively lowered as domestic price levels increase. It is designed to curb windfall profits that would accrue to exporters after a currency devaluation by maintaining export prices in terms of other currencies. This, however, tends to depress domestic price levels for oils and cakes by establishing a higher margin between export and domestic prices. It is particularly aggravating for the agricultural sector when nonagricultural price levels are increasing. However, this is compensated for in that the retention tax is lowered progressively as domestic prices rise.

The export tax is levied against an index value, in the case of cottonseed, tung, rapeseed, and boiled linseed oil. This keeps the ad valorem taxes constant. The index value is revised periodically as world price levels change. This structure is designed to keep prices for Argentine agricultural products competitive with world market prices.

The export index value also represents a minimum export price. For each unit of product, exporters must convert foreign currencies at an amount at least equal to the index value.

The export index value was introduced by the government in an effort to prevent private exporters from understating the commodity value on their export certificates, thereby reducing their export tax obligation.

### Exports by the National Grain Board

The vast majority of Grain Board sales are made to domestic crushers or private exporters. The oilseeds

are processed domestically with the products sold on the local market or exported.

In only two cases since 1960 has the Grain Board exported directly on a government-to-government basis. Sales of linseed oil were made to the USSR on a cash basis, the Board in turn paying the export taxes (Table 17).

The Grain Board continues to sell large quantities of linseed oil to exporters. In case of exports, two different index values are used to differentiate EC and now EC destinations.

### Argentina's Position in World Markets

The Argentine Government restricts exports of oilseeds and allows only exports of the byproducts, oil and meal. Argentina, thus excludes itself from demand for crushing materials by foreign crushers and competes solely in the oil and meal markets, principally the commercial markets of Western Europe and LAFTA countries, as transportation costs limit Argentine competition.

In the expanding world meal market, Argentine has been receiving a declining percentage of the total market due to nonavailability. In 1962, Argentina supplied 8.0 percent of the world meal market (defined in meal equivalent terms), which declined steadily over the rest of the decade to 3.4 percent by 1969 (Table 41).

In the edible oil market, Argentina has attained the stigma of being an irregular supplier, as the percentage of the world market supplied by Argentina varies considerably from year to year. In the expanding sunflowerseed oil market, Argentina averaged 14 percent of the market in the 1955-59 period, dropped to 5 percent in 1960-64 and rose to 8 percent in the 1965-69 period. On the other hand, Argentina has supplied an increasing percentage of the peanut oil market, rising from 6 percent in 1955-59 to 13 percent in 1960-64 and to 14 percent in the 1965-69 period, at the expense of primarily the African nations. There also seems to be some slight relationship between U.S. and Argentine exports of peanut oil, as Argentine exports seem to increase when U.S. exports are unavailable.

In the inedible oil market, Argentina is more consistent, supplying 50 percent of the linseed oil market in 1955-59, 77 percent in 1960-64, and 69 percent in 1965-69, with smaller variations from year to year than for edible oils. Argentina is the primary supplier of this commodity and is the principal competitor with U.S. exports. In the linseed oil market, the United States appears to be a residual supplier, as Argentine exports vary inversely with U.S. exports.

TABLE 41--ARGENTINA'S SHARE OF WORLD MARKET IN SELECTED OIL AND OILCAKE EXPORTS

Year	Sunflower oil			Linseed oil		
	Argentina	World	Share of market	Argentina	World	Share of market
	<i>Metric tons</i>	<i>Metric tons</i>	<i>Percent</i>	<i>Metric tons</i>	<i>Metric tons</i>	<i>Percent</i>
1960 .....	13.6	165.8	8.2	169.0	256.3	65.9
1961 .....	31.0	214.9	14.4	280.7	280.7	72.8
1962 .....	14.9	250.6	5.9	264.1	305.6	86.4
1963 .....	4.4	320.8	1.4	212.9	275.5	77.3
1964 .....	(1)	259.6	—	205.1	254.4	80.6
Average .....	10.8	242.3	5.3	211.1	274.5	76.9
1965 .....	35.5	300.4	11.7	239.1	307.3	77.8
1966 .....	78.0	593.7	13.1	121.5	222.8	54.5
1967 .....	81.0	890.3	9.1	211.3	271.2	77.9
1968 .....	80.0	951.3	8.4	98.2	197.7	49.7
1969 .....	7.3	801.4	.9	166.8	214.2	77.9
Average .....	56.4	711.8	7.9	167.4	242.6	69.0

Year	Peanut oil			Oilcakes (meal eq. basis)		
	Argentina	World	Share of market	Argentina	World	Share of market
	<i>Metric tons</i>	<i>Metric tons</i>	<i>Percent</i>	<i>Metric tons</i>	<i>Metric tons</i>	<i>Percent</i>
1960 .....	50.6	306.9	16.5	774	11,030	7.0
1961 .....	30.8	267.1	11.5	804	10,830	7.4
1962 .....	98.5	361.2	27.8	1,015	10,730	8.0
1963 .....	36.4	375.8	9.7	883	13,540	6.5
1964 .....	.5	384.6	.1	864	15,310	5.6
Average .....	43.4	339.1	12.8	868	12,688	6.8
1965 .....	61.9	405.6	15.3	1,051	16,390	6.4
1966 .....	79.2	443.3	17.9	941	18,090	5.2
1967 .....	62.4	430.9	14.5	929	18,850	4.9
1968 .....	61.5	502.8	12.2	798	20,140	4.0
1969 .....	39.0	370.9	10.5	687	20,080	3.4
Average .....	60.8	430.7	14.1	881	18,700	4.7

## Taxes

Government tax in the agricultural sector includes sales, land, and export taxes. The Federal and Provincial governments are empowered to collect these taxes. Sales taxes are the largest source of tax revenue and in 1961 represented 55 percent of total taxes collected. In second place as a source of governmental income was the export tax, at about 37.5 percent of the total. It has been estimated that land taxes represent only about 3 percent of crop production costs.

## Supporting Roles

The National Institute of Agrucultural Technology (INTA) was formed in 1956, within the Ministry of Agriculture and Livestock, to provide assistance to the farmer in solving his production problems. Prior to the establishment of INTA, agricultural research

was the province of the Secretariat of Agriculture. Progress was limited by the lack of adequate funds to carry out various projects. The research staff of the Secretariat of Agriculture was transferred to INTA when it was created.

INTA is a semiautonomous Government agency. It is responsible for agricultural research and extension programs in Argentina. Operating funds are derived from a 1.5-percent tax on all agricultural exports.

INTA's programs have been oriented to those crops that move into export markets, since they receive their operating funds from this source. Sunflowerseed and flaxseed have received the most attention, but peanut oil and meal, with their excellent marketing prospects, appear to be a prime area for additional work by INTA.

Some research and extension activities are carried out by individual trade groups and some provincial experiment stations; however, the principal effort is expected to continue to be directed by INTA.

## FUTURE PROSPECTS

### Problems in Forecasting Oilseed Acreage

Economic theory indicates that given no production controls, farm managers will decide among production alternatives according to differentials in expected price levels, which are translated into expected returns. In Argentina, the major competing alternatives with oilseeds are grains and livestock (pasture and forage).

The agricultural economy of Argentina, in fact, is dominated by grain crops and livestock operations, with oilseeds being a residual crop. This results primarily from the structure of the Argentine agriculture, which tends to be oriented around the extensive production of livestock (principally cattle) on very large farms, with the livestock fed on pasture and forage crops. Grains provide not only an alternative cash crop but also can serve as a reserve forage if during the summer there has not been enough moisture to maintain the level of the pasture usage. As oilseed crops cannot generally be used as a potential forage, they are grown only when there is enough pasture and cropland planted to provide for the potential needs of livestock operations. Also, prices have to be competitive with alternative grain crops. Prices, therefore, only influence the production of oilseeds on the residual cropland.

Another major factor affecting potential production trends of oilseeds is weather. Production of oilseeds is not evenly distributed over the Pampean region, but tends to be concentrated in certain areas. This makes production highly susceptible to the vagaries of weather, an example being the dramatic drop in sunflowerseed yields in 1971 due to excessive rainfall at harvesttime. Moreover, oilseed crops, much like soybeans in the United States, tend to be planted after grains. If there is an early planting season, more corn will be planted relative to sunflowerseed, or more wheat relative to flaxseed and vice versa. Peanut production is also highly regionally concentrated, and ground moisture at the time of planting is a major determinant of acreage planted.

Since weather is such a big variable and short-term price response is only marginal, the best prediction of more immediate production of oilseeds appears to be acreage trends and average yields. Over the longer

term, however, world price levels will determine the future level of Argentine oilseed production.

### Influence of Government Policy

Government policy designed to influence the production of oilseeds is transmitted to the farmer primarily through its price support program and input assistance. For example, to promote the increased production of soybeans, the Government raised the 1971-72 support price 43 percent to 430 new pesos per ton — well above the percentage rise in any of the other support prices.

However, for the reasons stated in the previous section, change in price support of oilseeds has a limited impact on change in acreage. Furthermore, support prices are often announced after planting has already taken place and thereby serve only as a floor price at harvest.

Government plays its major role in fostering increased production through its support of research activities. Much of this research has been directed at developing varieties that are higher yielding and more disease resistant. The increase in sunflowerseed yields through the last 5 years has been a product of this research. Nevertheless, yields still remain relatively low compared to those of other developed countries.

It should be noted, however, that the Government's policy to retain the export system seriously reduces farm income in the oilseed sector. If export taxes were abolished or greatly reduced, farm income would rise sharply, and capital for further improvement of oilseed cultivation would become available. The Government's policy, however, continues toward more control over the direction of capital investments; i.e., away from agriculture.

### Production and Export Forecasts

The National Development Plan for 1971-75 aims at increasing the economic growth rate (GNP) to 8 percent annually, and the per capita annual growth rate to 5.5 percent. The industrial sector is expected to be the most dynamic sector. However, the Plan notes that the growth rate of the farm sector during the sixties was 2.2 percent annually, higher than that of the three previous decades but too low considering

the potential of the sector. For oilseeds, the Plan has set a goal of 1,404,000 tons of sunflowerseed by 1975, 23 percent over the 1969-70 record production and 43 percent over the last 5-year period. For linseed, the Plan foresees a production of 600,000 tons, which would mean a leveling off of production at about the current level. The Plan states that "a stable and coherent price policy will be established that will help these objectives to be reached, and act as a guide to determining when there should be intervention in the market."

It should be noted, however, that plans for Argentine flaxseed production were announced prior to the recent sharp decline in acreage.

**Sunflower.** Area planted in 1970-71, at 1,614,200 hectares was the second largest on record—exceeded only by the 1.8 million planted in 1948-49. Area has reached 1.6 million hectares six times since the crop's introduction in Argentina but averaged only 1.2 million during the sixties.

The potential for any further increase in acreage is not known, since it is difficult to isolate the factors responsible for such changes. However, certain generalizations can be made. It appears that there is very little capacity for expansion of first-crop sunflowerseed in view of corn is greater profitability. However, there is some further potential for sunflowerseed planted as a second crop following wheat, since there are some 2 million hectares of wheat that have not been secondcropped with sunflowerseed. This area, which excludes regions where sunflowerseed is not grown because of climatic factors, is greater than current sunflower plantings. Although the potential for expanded acreage is there, it is not certain what factors influence changes in the second-cropping of sunflowerseed.

Yields and rates of abandonment provide possibly the major avenue of increasing sunflower production. Yields at experiment stations have been substantially higher than average yields, and even the world average for 1966-70 was 1,150 kilograms per hectare, compared with just over 800 in Argentina.

Taking the Development Plan production goal of 1,404,000 tons by 1975 as a guide, one can get an idea of the changes that might be made. Using the average yield of the 1965-69 period of 828 kilograms per hectare and an average abandonment rate of 12 percent, an acreage of over 1.9 million hectares would be required to reach the goal. However, assuming the 1970-71 acreage of 1,650,000 hectares, and the lowest abandonment rate over the last 5-year period of 9 percent, achieved in crop year 1969-70, a yield of 936 kilograms per hectare would be required to reach the goal. Considering the increasing trend in yields of the last 5 years, and the fact that yields did reach the 900 kilogram level in 1966-67, the goal could easily be attained. Thus, a production figure of from 1.4

million to 1.5 million tons of seed appears to be a realistic production level in 1975.

**Flaxseed.** The National Development Plan anticipates production in 1975 at 600,000 tons, slightly less than the average of the past 10 years and well above the 1971-72 estimate. In order to reach this level of production, 925,000 hectares would need to be planted, and yields of 650 kilograms per hectare, attained. This goal does not appear unreasonable on the supply side. However, with a continuing slackening of world demand for linseed oil and strong competition from the United States and Canada, we expect flaxseed production in Argentina to decline further. Our projection is that flaxseed production will decline to 400,000 metric tons, which would require planting of about 600,000 hectares; this is the level of estimated production in 1971-72.

**Peanuts.** The National Development Plan does not provide a guide to government plans regarding peanut production. However, with continuing good peanut prices in Argentina, strong world demand for oil and meal, good demand for meal from the domestic poultry industry, and recent indications that farmers are joining together to buy peanut production equipment, we project a reversal of the downtrend apparent in acreage during the late 1960's. By 1971, acreage had rebounded to 310,000 hectares from a low of 215,000 in 1969-70, and yields, to about 1,200 kilograms from their recent low of 891 in 1968-69. This would indicate a rise in production to around 350,000-400,000 tons where it is likely to remain through the mid-1970's.

**Soybeans.** No mention is made of soybean prospects in the National Development Plan. However, the oilseed trade estimates soybean production will increase to 300,000 metric tons by 1975. Even with production at the level of the trade estimate, soybean meal production will not be large enough to satisfy the domestic requirements of the expanding poultry industry. At the present time, soybean meal production is only 1 percent of the total—well behind sunflowerseed 43 percent and flaxseed 43 percent. Our estimate is that soybean production could reach or exceed 300,000 tons by 1975 if world prices remain strong and demand for meat continues the trend of recent years. Domestic requirements for the meal from these beans are apparent.

Some expansion in bean acreage is expected to take place in the current major producing areas of Misiones, but more likely is further expansion in Tucuman and possibly the Pampa and Santa Fe. Cotton production is anticipated to continue providing strong competition in Chaco and the northern areas of Santa Fe.

TABLE 42--ARGENTINE: PRODUCTION, DOMESTIC USE, AND EXPORTS OF SPECIFIED OILSEEDS, AVERAGE 1965-69 AND PROJECTED 1975

Oilseeds	Average 1965-69						Projected 1975						Export change Meal    Oil			
	Production		Domestic use		Exports		Total		Production <sup>1</sup>		Domestic use				Exports	
	1,000 metric tons	1,000 metric tons	Meal	Oil	Meal	Oil	1,000 metric tons	1,000 metric tons	Meal equiv.	Oil equiv.	Meal	Oil			1,000 metric tons	1,000 metric tons
Sunflowerseed ...	972	44	244	368	70	1,400	630	490	143	300	487	190	+32	+171		
Flaxseed .....	536	-11 <sup>2</sup>	14	314	153	400	260	124	0	10	260	114	-17	-25		
Peanuts .....	300	8	10	102	57	350	189	158	100	25	89	132	-13	+152		
Soybeans .....	24	19	4	0	0	150	117	25	117	25	0	0	0	0		
Total .....	1,832	60	272	784	280	2,300	1,196	797	360	350	836	436	+7	+56		

<sup>1</sup> Oilseed equivalents: Sunflowerseed meal (45 percent), oil (35 percent); flaxseed meal (65 percent), oil (31 percent); peanut meal (54 percent), oil (45 percent) and soybean meal (78 percent), oil (22 percent).

peanut meal (54 percent), oil (45 percent) and soybean meal (78 percent), oil (17 percent).

If our 1975 projections of oilseed production are realized, Argentina will produce about 2,300,000 metric tons, compared with the 1965-69 average of 1,832,000 for an increase of about 25 percent. The largest increase is expected to take place in sunflowerseed production, followed by soybeans and peanuts. A decline is anticipated in the production of flaxseed. Oilseed production at the 1975 projected level would produce 1,200,000 metric tons of meal and 800,000 of vegetable oil (Table 42).

We are estimating a substantial increase in the domestic use of both meal—5 times the 1965-69 level—and oil—up 29 percent. Even so, the export availability of meal in 1975 will be 7 percent above average. The big increase in domestic utilization is expected to take place in sunflowerseed meal, while that of peanut and flaxseed is expected to decline.

In case of vegetable oils, an increase in exports of about 56 percent is anticipated. The largest increase will be in sunflowerseed oil, which will be more than 2½ times average. The next largest increase is expect-

ed in peanut oil, while a slight decline will occur in linseed oil.

A recent exhaustive study by FAO provides oilseed and product projections through 1980. This study indicates that by 1980 Argentine production of oilcakes and meals will total 1,254,000 tons, or slightly above our 1975 projection. FAO projects Argentine cake and meal export at 1,090,000 tons, while we estimate only 850,000. This difference reflects our views concerning the increases in domestic requirements. Even if Argentina does attain the projected FAO level of cake and meal exports, it will decline in importance as a world supplier, accounting for 3.6 percent of this trade in 1980, compared with 4.1 percent in 1970.

In the case of oil, the FAO study projects export availability at 547,000 tons by 1980, compared with our projections of about 436,000 by 1975. We doubt that the export availabilities of vegetable oils can increase to the FAO level by 1980.





# APPENDIX

TABLE 1--ARGENTINE VEGETABLE OIL PROCESSING FACILITIES AND OPERATING CAPACITY BY PROVINCE

Name	Location	Seed <sup>1</sup> processed	Daily capacity
<b>FEDERAL CAPITAL, GREATER BUENOS AIRES</b>			
Solvent extraction:			
Alejandro Bonfanti S.A. (Parada) . . . . .	San Justo	Sunflower, peanuts, flax	170
Adolfo Braunstein S.A. . . . .	Avellaneda	Sunflower, peanuts, flax	155
BYCLA S.A. . . . .	Valentin Alsina	Sunflower, peanuts, flax	200
Cia. Aceitera Argentina S.A. . . . .	San Martin	Sunflower, peanuts, flax	170
Dockoil S.A. . . . .	Dock Sud	Sunflower, peanuts, flax	230
S.A. Genaro Garcia Ltda. . . . .	Avellaneda	Sunflower, peanuts, flax	105
Heliantus S.A. . . . .	Lanus	Sunflower, peanuts, flax	70
ECO-Isidoro Weil y Cia. S.A. . . . .	San Justo	Sunflower, peanuts, flax	100
Milinos Rio de la Plata S.A. . . . .	Avellaneda	Sunflower, peanuts, flax	260
S. A. Fabricas y Refin. de Aceites "S. A. F. R. A." . . . . .	Valentin Alsina	Sunflower, peanuts, flax	370
Pre-press solvent: Sasetru S. A. . . . .	Avellaneda	Sunflower, peanuts, flax	1,000
Continuous presses:			
Aceitera Bernal S.A. . . . .	Bernal	Flax	60
Campo Y Cia. S.R.L. (Parada) . . . . .	Avellaneda	Sunflower, peanuts, flax	120
Cozzo Hnos. S.R.L. . . . .	Saenz Pena	Flax	70
FADAD S.R.L. . . . .	Lanus	Sunflower, peanuts, flax	60
FAPO S.A. . . . .	Miguelotes	Sunflower,	50

Metric tons

TABLE 1--ARGENTINE VEGETABLE OIL PROCESSING FACILITIES AND OPERATING CAPACITY BY PROVINCE -- Continued

Name	Location	Seed processed <sup>1</sup>	Daily capacity
<b>FEDERAL CAPITAL, GREATER BUENOS AIRES (con't.)</b>			
<i>Metric tons</i>			
Continuous presses:			
Pablo Ferrari S.R.L. ....	Capital Federal	Sunflower and peanuts	110
Hijos de Ybarra Argentina S.A. ....	Florida	Sunflower and peanuts	1 60
Emilio Machotta S.A. ....	Capital Federal	Sunflower and peanuts	1 60
Luis Podesta S.A. (Parada) ....	Capital Federal	Flax	60
SUPRA S. R. L. ....	Lanus	Flax	40
<b>BUENOS AIRES PROVINCE</b>			
Solvent extraction:			
Tirabaso Y Rabal S.A. ....	Bahia Blanca	Sunflower and flax	1 85
Continuous presses:			
Acitera de Monte S.A. ....	Monte	Flax	60
Asoc. Coop. Argentinas Coop. Ltda. ....	Tres Arroyos	Flax	40
Catuogno Y Cia. S.A. ....	Mar del Plata	Sunflower and flax	1 80
Cia. Oleaginosos de Olavaria S.A. .... (Parada)	Olavaria	Sunflower and flax	100
Industrial Aceitera Junin-Bs.As.S.A. ....	Junin	Sunflower and flax	1 50
La Isabel S.A. (Parada) ....	Carlos Casares	Sunflower	35
La Linoplatense ....	Tandil	Flax	50

TABLE 1--ARGENTINE VEGETABLE OIL PROCESSING FACILITIES AND OPERATING CAPACITY BY PROVINCE -- Continued

Name	Location	Seed processed <sup>1</sup>	Daily capacity
<b>BUENOS AIRES PROVINCE (con't.)</b>			
<i>Continuous presses:</i>			
La Necochea Quequen S.A. ....	Necochea	Flax	75
La Oleaginosa de Huanquelen S.A. ....	Huanquelen	Sunflower	1 80
Molino Aceitero del Sud .....	Las Flores	Sunflower and flax	70
Oleaginosa Moreno Hnos. S.A. ....	Bahia Blanca	Flax	160
Rabal Zugasti Y Cia. S.A. ....	Quequen	Flax	50
Rio Lujan S.A. (Parada) .....	Mercedes	Sunflower and flax	1 45
SEDASA .....	Lezama	Flax	110
<b>SANTA FE PROVINCE</b>			
<i>Solvent extraction:</i>			
Assoc. Coop. Argentinas Coop. Ltda. ....	Villa Constitucion	Sunflower	1 85
Cia. Swift de La Plata S.A. ....	Villa Gob. Galvez	Sunflower, peanuts, and flax	1 350
Molinos Rio De La Plata S.A. ....	San Lorenzo	Sunflower, peanuts, and flax	1 230
Hugo Romegalli .....	Canada de Gomez	Sunflower, peanuts, and flax	1 50
Santa Clara S.A. ....	Rosario	Sunflower	1 200
<i>Pre-press solvent:</i>			
INDOSAC .....	Pto. San Martin	Sunflower, peanuts, and flax	200
Vicentin, S. A. ....	Avellaneda (Bec.)	Cotton, flax and sunflower	630

TABLE 1—ARGENTINE VEGETABLE OIL PROCESSING FACILITIES AND OPERATING CAPACITY BY PROVINCE — Continued

Name	Location	Seed processed	Daily capacity <i>Metric tons</i>
<b>SANTA FE PROVINCE (con't.)</b>			
<b>Continuous presses (con't.):</b>			
Aceitera Bigand S.R.L. (Parada) . . . . .	Bigand	Sunflower	25
Aceitera Serodino S.R.L. (Parada) . . . . .	Serodino	Sunflower	30
Aceitera Teodelina S.R.L. (Parada) . . . . .	Teodelina	Sunflower	30
Asoc. Coop. Argentinas Coop. Ltda. . . . .	Rosario	Flax	65
Buyatti S. A. . . . .	Reconquista	Cotton, flax, sunflower	1 120
CAPI S. R. F. (Parada) . . . . .	Pueblo Yrigoyen	Flax	35
Octavio Camuso y Cia. S.R. L. . . . .	Santo Tome	Flax	70
Coop. Agrícola Ganadera Ltda. . . . .	Gob. Crespo	Flax	50
F. A. E. L. S. R. L. (en venta) . . . . .	Esperanza	Flax	100
Hein Hnos. S. R. L. . . . .	Esperanza	Sunflower, peanuts, flax	1 90
Fos Hessel e Higos S. R. L. . . . .	Esperanza	Sunflower, peanuts, flax	65
La Vegetal Oil S. R. L. (Parada) . . . . .	Villa Canas	Sunflower, peanuts, flax	35
Linera Gob. Crespo S. A. (Parada) . . . . .	Gob. Crespo	Flax	40
S. A. Marconetti Ltda. . . . .	Puerto Santa Fe	Flax	40
S. A. Marconetti Ltda. . . . .	Santo Tome	Sunflower, peanuts, flax	1 70
Molino Esperanza S. A. . . . .	Esperanza	Flax	55
Sol de Mayo S. R. L. . . . .	Rafaela	Flax	50

TABLE 1--ARGENTINE VEGETABLE OIL PROCESSING FACILITIES AND OPERATING CAPACITY BY PROVINCE - Continued

Name	Location	Seed processed <sup>1</sup>	Daily capacity
<b>CORDOBA PROVINCE</b>			
Continuous presses: (con't.)			<i>Metric tons</i>
Solvent extraction:			
Oleaginoso Rio Cuarto S. A. ....	Rio Cuarto	Sunflower	<sup>1</sup> 170
Oleaginoso Villa, Maria S. A. ....	Villa Maria	Sunflower and peanuts	<sup>1</sup> 180
Pre-press solvent:			
Aceitera General Deheza S. A. ....	General Deheza	Sunflower, peanuts, flax	<sup>1</sup> 350
Aceitera Villa Dolores S. A. (Parada) .....	Villa Dolores	Sunflower and peanuts	<sup>1</sup> 30
Asoc. Coop. Argentinas Coop. Ltda. ....	Rio Tercero	Peanuts, flax	80
Coop. La Vencedora .....	Hernando	Peanuts	40
Fed. Arg. Coop. Agrarias Coop. Ltda. ....	Tancacha	Sunflower and Peanuts	120
Guipeda S. R. L. ....	Tancacha	Peanuts	70
Delata S. A. ....	Beñotaran	Sunflower, peanuts, flax	<sup>1</sup> 100
Oleag. Gral. Cabrera "OLCA" S. A. ....	Gral. Cabrera	Peanuts, flax	<sup>1</sup> 100
Storani Hnos. S. A. ....	Dalmacio Velez	Peanuts, flax	<sup>1</sup> 100
<b>ENTRE RIOS PROVINCE</b>			
Solvent extraction:			
C.I.P.O.S.A. ....	Concordia	Sunflower and flax	75

TABLE 1 --ARGENTINE VEGETABLE OIL PROCESSING FACILITIES AND OPERATING CAPACITY BY PROVINCE -- Continued

Name	Location	Seed processed <sup>1</sup>	Daily capacity
ENTRE RIOS PROVINCE (cont'd)			
Continuous presses:			
Aceitera y Algod. Litoral S.A. (Parada) . . . . .	Concepcion del Uruguay	Flax	Metric tons 100
Aceitera Hernandez . . . . .	Hernandez	Flax	35
Aceitera Gualaguay S. R. L. . . . .	Gualaguay	Flax	50
Aceitera Gualaguaychu S. S. . . . .	Gualaguaychu	Flax	100
Aceitera Piedras Blancas S. R. L. . . . .	Piedras Blancas	Flax	80
C. I. D. A. S. C. A. . . . .	Nogoya	Flax	65
Coop. Agrícola Ganadera de Virazo. . . . .	Bovril	Flax	40
Castoroil S. A. . . . .	Chajari	Flax	45
Diamante S. A. . . . .	Strobel	Sunflower and flax	70
Fondo Comunal Soc. Coop. Ltda. . . . .	Villa Dominguez	Flax	70
Galizzi Hnos. y Cia. S. R. L. . . . .	Parana	Flax	50
Guaita Ind. Aceitera S. R. L. . . . .	Victoria	Flax	50
Jaime Hnos. S. R. L. . . . .	Texano Pinto	Flax	80
La Industrial Luquense S. R. L. . . . .	Lucas Gonzalez	Flax	70
Schimpf & Weber (Parada) . . . . .	Galarza	Flax	35
Sagemuller Hnos. S. A. . . . .	Crespo	Flax	50
DEL CHACO PROVINCE			
Solvent extraction:			

TABLE 1--ARGENTINE VEGETABLE OIL PROCESSING FACILITIES AND OPERATING CAPACITY BY PROVINCE -- Continued

Name	Location	Seed processed <sup>1</sup>	Daily capacity
<i>Metric tons</i>			
DEL CHACO PROVINCE (con't.)			
Solvent extraction (con't.):			
Molinos Río de la Plata S. A. . . . .	Puerto Vilelas	Sunflower, cotton and tung	<sup>1</sup> 220
U. C. A. L. Union Coop. Agric. Algod. Ltda. (en venta) . . . . .	Resistencia	Cotton, sunflower	<sup>1</sup> 180
Continuous presses:			
M. Comero y Cia. S. A. . . . .	Resistencia	Cotton	<sup>1</sup> 45
Coop. Aceitera le Breton . . . . .	Rio Araza	Cotton	40
U. C. A. L. Coop "La Union" . . . . .	Pres. R. S. Pena	Cotton	<sup>1</sup> 25
U. C. A. L. Coop "Saenz Pena" Ltda . . . .	Pres. R. S. Pena	Sunflower	<sup>1</sup> 30
FORMOSA PROVINCE			
Aceitera Formosa S. A. (en montaje) . . . . .	Formosa	Cotton, sunflower, peanuts	100

<sup>1</sup> Includes refinery.

**[In metric tons]**

Year	Edible oil					Inedible oil				Total	
	Sunflower	Cottonseed	Peanut	Rapeseed	Olive	Other edible <sup>1</sup>	Total edible	Linseed	Tung		Total edible
Average:	47,579	18,127	10,351	7,480	67	437	84,041	7,105	30	7,135	91,176
1936-40 ...	151,275	20,920	13,384	13,490	523	2,095	201,687	161,613	324	161,937	363,624
1941-45 ...	199,801	19,968	26,189	6,104	1,785	2,991	256,838	194,051	3,050	197,101	453,939
1946-50 ...	130,259	28,511	35,831	2,579	3,375	4,186	204,741	134,637	11,193	145,830	350,571
1951-55 ...	172,989	23,016	58,967	2,026	7,963	5,315	270,276	150,376	17,500	167,876	438,152
1956-60 ...	184,149	25,858	69,248	1,585	7,531	7,736	296,107	211,321	14,395	225,716	521,823
1961-65 ...	310,830	24,020	67,292	562	9,685	9,288	421,677	148,826	22,263	171,089	592,766
1966-69 ...											
Annual:											
1960 .....	196,367	18,739	60,208	2,482	11,019	6,478	295,288	188,248	16,391	204,639	499,927
1961 .....	164,790	25,978	65,983	1,470	3,778	5,914	267,913	151,694	16,043	167,737	435,650
1962 .....	202,898	24,329	95,539	1,360	7,242	7,255	334,928	234,981	15,406	250,387	585,315
1963 .....	168,530	25,482	70,578	1,303	7,423	8,529	281,845	233,959	14,542	248,501	530,346
1964 .....	118,020	21,812	58,660	2,132	10,304	8,678	219,606	211,081	19,880	230,961	450,567
1965 .....	269,575	31,687	56,119	1,650	8,907	8,304	376,242	232,963	6,106	239,069	615,311
1966 .....	284,791	25,126	99,808	457	8,282	7,995	426,459	150,020	18,824	168,844	595,506
1967 .....	358,685	24,600	66,649	271	12,366	7,929	470,500	154,721	23,929	178,650	649,150
1968 .....	317,513	18,788	61,070	511	6,500	10,277	414,609	124,435	25,823	150,258	564,867
1969 .....	282,333	27,614	41,640	1,008	11,590	10,950	375,135	166,131	20,477	186,608	561,743

<sup>1</sup> Includes corn, soybean, sesame, and grapeseed oils.

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TABLE 3---ARGENTINE PRICES FOR SELECTED GRAINS AND OILSEEDS, IN CURRENT PESOS

Year	Wheat	Red corn	Grain sorghum	Oats	Barley	Rye	Linseed	Sunflower	Peanut <sup>1</sup>	Alfalfa <sup>2</sup>	Yellow corn	Cattle
1950 .....	24.77	35.21	-	20	22.06	18.08	37.81	40.29	88.67	172.51	31.22	.700
1951 .....	26.94	30.96	-	24.71	23.60	23.12	46.90	39.79	84.97	203.59	29.58	1.154
1952 .....	38.11	42.03	-	42.91	43.44	43.90	52.99	42.58	95.56	242.03	38.20	1.621
1953 .....	45.86	49.14	-	38.17	39.65	36.22	65.00	44.00	100.00	254.40	43.96	1.937
1954 .....	47.57	46.15	38.56	52.39	43.67	41.06	65.00	46.55	100.00	371.61	41.83	1.925
1955 .....	50.47	61.79	43.83	46.25	42.58	43.97	75.00	60.00	100.00	487.75	54.55	1.867
1956 .....	69.75	69.40	50.71	59.44	56.13	53.00	135.10	149.41	210.03	529.25	63.45	2.280
1957 .....	80.13	104.50	73.87	65.83	67.85	67.97	215.35	192.20	282.20	545.60	98.13	2.518
1958 .....	101.76	110.75	78.57	114.12	99.60	83.60	232.73	201.92	319.93	698.38	100.74	4.041
1959 .....	244.11	277.93	199.64	310.52	229.47	211.54	646.18	689.15	984.39	1,829.32	249.20	14.06
1960 .....	329.42	322.86	253.22	300.47	276.28	243.43	626.58	609.54	926.54	2,416.58	291.47	15.15
1961 .....	393.60	388.59	253.60	280.28	294.21	300.74	804.40	799.38	1,125.22	2,336.09	362.37	13.78
1962 .....	514.21	541.97	429.45	523.18	554.32	499.37	972.18	770.75	1,233.08	2,517.43	500.72	16.08
1963 .....	718.99	746.09	488.33	711.28	637.64	752.52	1,191.25	1,281.66	1,800.29	2,607.82	669.66	23.25
1964 .....	781.95	692.71	482.58	575.40	564.17	591.16	1,251.95	1,645.00	2,247.25	3,073.95	567.08	40.51
1965 .....	754.00	943.00	749.00	740.00	759.00	641.00	1,340.00	1,538.00	2,276.00	6,484.00	829.00	50.52
1966 .....	1,066.00	1,040.00	777.00	1,070.00	1,075.00	851.00	1,781.00	1,852.00	2,603.00	7,587.00	832.00	49.94
1967 .....	1,584.00	1,397.00	1,150.00	1,127.00	1,213.00	1,139.00	2,343.00	1,998.00	3,217.00	7,328.00	1,256.00	60.71
1968 .....	1,552.00	1,382.00	1,111.00	1,189.00	1,121.00	1,047.00	2,872.00	2,350.00	3,419.00	9,026.00	1,262.00	64.23
1969 .....	1,741.00	1,726.00	1,326.00	1,316.00	1,238.00	1,358.00	3,308.00	2,890.00	4,566.00	7,999.00	1,454.00	66.84
1970 .....	1,777.00	1,813.00	1,393.00	1,493.00	1,445.00	1,208.00	2,837.00	3,442.00	4,957.00	1,069.00	1,555.00	<sup>3</sup>

<sup>1</sup> Shelled, Industrial.<sup>2</sup> Bale.<sup>3</sup> Not Available.

TABLE 4--ARGENTINE SUNFLOWERSEED: SUPPLY AND DISTRIBUTION OF SEED, OIL, AND MEAL

[ In thousands of metric tons ]

Item	Year beginning April 1											
	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
SEED												
Supply:												
Beginning stocks	120.0	183.4	106.5	1327.0	1129.4	20.5	1201.3	96.6	1261.2	1108.3	45.9	86.9
Production	802.0	585.0	860.0	462.0	460.0	757.0	782.0	1,120.0	940.0	876.0	1,140.0	830.0
Imports	-	-	-	-	-	-	-	-	-	-	-	-
Total supply	822.0	768.4	966.5	1789.0	589.4	777.5	983.3	1216.6	1201.2	984.3	1,185.9	916.9
Disposition:												
Exports	-	-	-	-	-	-	-	-	-	-	-	-
Crushed	553.3	646.9	613.3	649.6	556.9	546.2	882.5	949.9	1,079.3	925.3	1,082.6	824.6
Seed and waste	85.3	15.0	26.2	10.0	12.0	30.0	4.2	5.5	13.6	13.1	16.4	9.5
Ending stocks	183.4	106.5	327.0	129.4	20.5	201.3	96.6	261.2	108.3	45.9	86.9	82.8
Total disposition	822.0	768.4	966.5	789.0	589.4	777.5	983.3	1216.6	1201.2	984.3	1,185.9	916.9
OIL												
Supply:												
Beginning stocks	22.9	33.4	15.2	8.9	12.9	6.2	33.2	16.4	47.1	16.3	19.2	19.9
Production	187.6	167.8	189.0	164.7	121.7	269.7	277.5	350.1	317.6	252.2	368.1	281.9
Imports	-	-	-	-	-	-	-	-	-	-	-	-
Total supply	210.5	201.2	204.2	173.6	134.6	275.9	310.7	366.5	364.7	268.5	387.3	301.8
Disposition:												
Exports	13.6	31.0	14.9	4.4	-	35.5	78.0	81.1	80.0	7.3	101.2	40.0
domestic consumption	163.5	155.0	180.4	156.3	128.4	207.2	216.3	238.3	268.4	242.0	266.2	244.3
Ending stocks	33.4	15.2	8.9	12.9	6.2	33.2	16.4	47.1	16.3	19.2	19.9	17.5
Total disposition	210.5	201.2	204.2	173.6	134.6	275.9	310.7	366.5	364.7	268.5	387.3	301.8
MEAL												
Supply:												
Beginning stocks	81.6	86.6	43.4	28.0	30.4	7.7	56.9	25.7	45.0	32.2	35.9	41.6
Production	232.9	215.4	250.0	229.7	168.6	340.7	355.5	431.6	384.4	312.8	486.5	409.8
Imports	-	-	-	-	-	-	-	-	-	-	-	-
Total supply	314.5	302.0	293.4	257.7	199.0	347.7	412.4	457.3	429.4	345.0	522.4	451.4
Disposition:												
Exports	217.9	248.6	255.4	217.3	181.3	275.8	371.7	394.3	379.2	291.1	403.8	310.0
Domestic consumption	10.0	10.0	10.0	10.0	10.0	15.0	15.0	18.0	18.0	18.0	77.0	104.2
Ending stocks	86.6	43.4	28.0	30.4	7.7	56.9	25.7	45.0	32.2	35.9	41.6	37.2
Total disposition	314.5	302.0	293.4	257.7	199.0	347.7	412.4	457.3	429.4	345.0	522.4	451.4

<sup>1</sup> Estimated.

TABLE 5---ARGENTINE PEANUT: SUPPLY AND DISTRIBUTION OF SEED, MEAL, AND OIL

[In thousands of metric tons]

Item	Year beginning April 1										
	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1970
<b>SEED</b>											
Supply:											
Beginning stocks	6.0	18.3	3.9	18.0	9.1	1.3	10.4	14.8	2.5	1.4	12.0
Production	209.3	266.0	433.0	312.0	333.0	439.3	410.8	354.0	282.8	217.0	387.6
Imports	—	—	—	—	—	—	—	—	—	—	—
Total supply	215.3	284.3	472.0	330.0	342.1	440.6	421.2	368.8	285.3	218.4	399.6
Disposition:											
Exports	—	—	—	—	—	—	—	—	—	—	—
Crushed	123.0	170.0	204.8	248.5	231.7	230.7	265.6	309.8	191.7	163.9	232.4
Consumed directly	61.7	93.3	228.7	47.5	85.9	176.3	113.6	25.1	73.0	35.0	125.0
Seed and waste	12.3	17.0	20.5	24.9	23.2	23.1	26.7	31.0	19.2	16.4	20.0
Ending stocks	18.3	3.9	18.0	9.1	1.3	10.4	14.8	2.5	1.4	3.1	12.0
Total disposition	215.3	284.3	472.0	330.0	342.1	440.6	421.2	368.8	285.3	218.4	399.6
<b>OIL</b>											
Supply:											
Beginning stocks	10.9	3.3	113.6	4.6	11.3	9.7	7.9	7.2	4.2	1.1	3.5
Production	58.7	69.9	91.0	83.4	75.7	88.3	99.6	68.3	59.7	47.7	81.1
Imports	—	—	—	—	—	—	—	—	—	—	—
Total supply	69.6	73.2	104.6	88.0	87.0	98.0	107.5	75.5	63.9	48.8	84.6
Disposition:											
Exports	50.6	30.8	98.5	36.4	5	61.9	79.2	62.4	61.5	39.0	42.6
Domestic consumption	15.7	28.8	1.5	40.3	76.8	28.2	21.1	8.9	1.3	8.4	6.9
Ending stocks	3.3	113.6	4.6	11.3	9.7	7.9	7.2	4.2	1.1	1.4	3.5
Total disposition	69.6	73.2	104.6	88.0	87.0	98.0	107.5	75.5	63.9	48.8	84.6
<b>MEAL</b>											
Supply:											
Beginning stocks <sup>1</sup>	46.0	34.5	30.7	8.0	22.7	22.2	42.6	27.9	25.7	22.8	42.9
Production	88.0	108.7	142.1	134.5	126.2	157.1	171.0	119.7	105.1	65.9	133.9
Imports	—	—	—	—	—	—	—	—	—	—	—
Total supply	134.8	143.2	172.8	142.5	148.9	179.3	213.6	147.6	130.8	88.7	176.8
Disposition:											
Exports	95.3	107.5	159.8	114.8	121.7	131.7	180.7	116.9	103.0	46.0	64.71
Domestic consumption	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Ending stocks	34.5	30.7	8.0	22.7	22.2	42.6	27.9	25.7	22.8	37.7	42.9
Total disposition	134.8	143.2	172.8	142.5	148.9	179.3	213.6	147.6	130.8	88.7	176.8

<sup>1</sup> Estimated.

TABLE 6--ARGENTINE SUPPLY AND DISTRIBUTION OF FLAXSEED AND LINSEED OIL AND MEAL

[In thousands of metric tons]

Item	Year beginning November 1											
	1959-60	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68	1968-69	1969-70	1970-71
<b>SEED</b>												
Supply:												
Beginning stocks	54.3	145.4	28.9	52.6	65.6	85.1	33.5	15.7	<sup>1</sup> 129.6	11.1	19.3	120.9
Production	825.0	562.0	818.0	838.6	771.0	815.0	570.0	577.0	385.0	510.0	640.0	680.0
Imports												
Total supply	879.3	707.4	846.9	891.2	836.6	900.1	603.5	592.7	514.6	521.1	659.3	800.9
Disposition:												
Exports <sup>2</sup>	63.0	99.0		20.7								
Crushed	614.9	527.5	716.5	776.1	720.1	761.9	552.0	415.4	471.4	489.4	469.3	536.6
Seed and waste	56.0	52.0	77.8	28.8	31.4	104.7	35.8	47.7	32.1	12.4	69.1	73.2
Ending stocks	145.4	28.9	52.6	65.6	85.1	33.5	15.7	<sup>1</sup> 129.6	11.1	19.3	120.9	191.1
Total disposition	879.3	707.4	846.9	891.2	836.6	900.1	603.5	592.7	514.6	521.1	659.3	800.9
<b>OIL</b>												
Supply:												
Beginning stocks	25.5	52.2	12.0	11.1	34.3	35.7	35.3	50.4	13.5	21.6	3.0	49.1
Production	202.6	159.7	242.2	242.7	225.2	248.4	155.6	122.6	150.4	<sup>1</sup> 157.0	231.1	246.7
Imports												
Total supply	228.1	211.9	254.2	253.8	257.5	284.1	190.9	173.0	163.9	178.6	234.1	295.8
Disposition:												
Exports	169.0	204.4	264.1	212.9	205.1	239.1	121.5	211.3	98.2	165.8	168.5	206.8
Domestic consumption	6.9			6.6	16.7	9.7	19.0		44.1	8.8	16.5	32.2
Ending stocks	52.2	12.0	11.1	34.3	35.7	35.3	50.4	13.5	21.6	3.0	49.1	56.8
Total disposition	228.1	211.9	254.2	253.8	257.5	284.1	190.9	173.0	163.9	178.6	234.1	295.8
<b>MEAL</b>												
Production	378.3	311.2	457.5	486.5	444.9	483.1	290.5	330.0	264.2	336.7	481.8	505.9
Exports	395.2	383.9	512.0	490.4	482.1	555.3	314.1	344.8	274.5	271.5	336.9	390.0

<sup>1</sup> Estimated.

<sup>2</sup> Calendar-year basis.

TABLE 7 -- ARGENTINE SUPPLY AND DISPOSITION OF COTTON SEED, OIL, AND MEAL

[In thousands of metric tons]

Item	Year beginning March 1										
	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1970
<b>SEED</b>											
Supply:											
Beginning stocks	40.6	2.0	42.7	23.1	72.5	56.6	122.9	81.1	29.9	4.2	74.4
Production	165.7	229.2	200.4	257.3	197.7	266.8	213.3	158.2	138.2	218.3	271.6
Imports	—	—	—	—	—	—	—	—	—	—	—
Total supply	206.3	231.2	243.1	280.4	270.2	323.4	336.2	237.3	168.1	222.5	356.0
Disposition:											
Exports	—	—	—	—	—	—	—	—	—	—	—
Crushed	189.2	147.1	175.9	174.0	179.3	176.4	226.9	193.9	151.8	134.1	248.1
Seed and waste	15.1	41.4	44.1	33.9	34.3	24.1	28.2	15.5	12.1	13.7	16.9
Ending stocks	2.0	42.7	23.1	72.5	56.6	122.9	81.1	29.9	4.1	74.4	91.0
Total disposition	206.3	231.2	243.1	280.4	270.2	323.4	336.2	237.3	168.1	222.2	356.0
<b>OIL</b>											
Supply:											
Beginning stocks	9.4	4.0	6.7	3.4	3.3	1.5	5.5	3.8	4.0	1.7	2.5
Production	13.7	17.6	19.1	18.8	17.7	31.7	27.2	21.1	15.6	26.6	35.7
Imports	—	—	—	—	—	—	—	—	—	—	—
Total supply	23.1	21.6	25.8	22.2	21.0	33.2	32.7	24.9	19.6	28.3	38.2
Disposition:											
Exports	4.0	4.0	7.6	2.2	3	1.1	1.4	4.9	6.5	2.9	1.0
Domestic consumption	15.1	10.9	14.8	16.7	19.2	26.6	27.5	16.0	11.4	22.9	30.0
Ending stocks	4.0	6.7	3.4	3.3	1.5	5.5	3.8	4.0	1.7	2.5	7.2
Total disposition	23.1	21.6	25.8	22.2	21.0	33.2	32.7	24.9	19.6	28.3	38.2
<b>MEAL</b>											
Supply:											
Beginning stocks	23.0	12.7	23.7	3.7	21.6	7.8	12.1	15.6	2.8	5.8	1
Production	58.0	77.6	71.0	72.8	68.8	96.6	82.7	65.2	49.5	83.7	115.0
Imports	—	—	—	—	—	—	—	—	—	—	—
Total supply	81.0	90.3	94.7	86.5	90.4	104.4	94.8	80.8	52.3	89.5	(1)
Disposition:											
Exports	65.3	3.6	88.0	60.9	78.6	88.3	74.2	73.0	41.5	78.8	88.9
Domestic consumption	3.0	3.0	3.0	4.0	4.0	4.0	5.0	5.0	5.0	5.0	1
Ending stocks	12.7	23.7	3.7	21.6	7.8	12.1	15.6	2.8	5.8	5.7	1
Total disposition	81.0	90.3	94.7	86.5	90.4	104.4	94.8	80.8	52.3	89.5	1

<sup>1</sup> Not available.

TABLE 8--ARGENTINE OLIVE AND TUNG OIL: SUPPLY AND DISTRIBUTION  
[In thousands of metric tons]

Item	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
<b>OLIVE OIL</b>											
Supply:											
Beginning stocks . . . . .	4.1	2.7	4.6	2.4	2.0	2.1	4.4	3.4	3.4	2.4	1.2
Production . . . . .	11.0	3.8	7.2	7.4	10.3	8.9	8.3	12.4	6.5	11.6	9.6
Imports . . . . .	—	—	—	—	—	—	—	—	—	—	—
Total supply . . . . .	15.1	6.5	11.8	9.8	12.3	11.0	12.7	15.8	9.9	14.0	10.8
Disposition:											
Exports . . . . .	11.4	.6	9.2	7.6	9.8	4.8	7.7	8.8	5.2	13.5	3.1
Domestic consumption . . . . .	1.0	1.3	.2	.2	.4	1.8	1.6	3.6	2.3	.2	5.2
Ending stocks . . . . .	2.7	14.6	12.4	2.0	2.1	4.4	3.4	3.4	2.4	11.2	2.5
Total disposition . . . . .	15.1	6.5	11.8	9.8	12.3	11.0	12.7	15.8	9.9	14.9	10.8
<b>TUNG OIL:</b>											
Supply:											
Beginning stocks . . . . .	14.6	10.6	9.2	7.2	4.7	12.0	4.4	6.4	3.4	8.4	3.2
Production . . . . .	16.4	16.0	15.4	14.5	19.9	6.1	18.8	23.9	25.8	20.5	14.3
Imports . . . . .	—	—	—	—	—	—	—	—	—	—	—
Total supply . . . . .	31.0	26.6	24.6	21.7	24.6	18.1	23.2	30.3	29.2	28.3	17.5
Disposition:											
Exports . . . . .	19.4	16.4	16.4	16.0	11.6	11.6	14.7	25.4	18.5	23.6	14.1
Domestic consumption . . . . .	1.0	1.0	1.0	1.0	1.0	2.1	2.1	1.5	2.3	1.5	.8
Ending stocks . . . . .	10.6	9.2	7.2	4.7	12.0	4.4	6.4	3.4	8.4	3.2	2.6
Total disposition . . . . .	31.0	26.6	24.6	21.7	24.6	18.1	23.2	30.3	29.2	28.3	17.5

<sup>1</sup> Estimated

